

COAL AGE

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Safety

BY BERTON BRALEY

Written expressly for Coal Age

When everything is going right
And life is merry as a song,
When there is lots of work in sight
And luck is running good and strong,
It's fun to travel with the bunch
And blow your money like a king,
But—just you get my little hunch,
A bank account's a handy thing.

Today you mine the good black coal
And do your work and draw your pay,
And then you spend your little roll
And life is glorious and gay,
Tomorrow—things may go to smash
Your luck may turn from fine to rank,
And then you'll wish you had the cash
You might have salted in the bank.

You can't be certain of your fate,
The roof may fall, the damp explode,
And that'll be a bit too late
To save the money that you "blowed,"
Your wife and kids will mourn for you
And starve, perhaps, because you died,
Why not cut out a spree or two
And lay a little roll aside?

The game of life is mighty tough
And rainy days are often met,
It's wise to lay away the stuff
To keep you safely from the wet,
Just bank a little of your pelf,
Don't spend your earnings fast and free,
—I never saved a cent, myself,
But don't you be a fool like me!

Cause and Effect of Colorado Strike

[A personal letter to the editor of Coal Age, and published by special permission.]

I regret that the press of the country has been so willing to print sensational stories concerning the strike in Colorado. Prior to the trouble which commenced last September, we were paying higher prices for labor in our mines than were paid in most Eastern fields, and our men were receiving better wages as a whole than in almost any section of the country.

We were, and had been for some time, working eight hours per day; were paying twice a month in cash; had abolished the use of scrip; were always willing to allow the miners a checkweighman; and in fact were complying with all the demands made except the increase of wages and recognition of the union. Our men were, so far as we could tell, entirely contented and subsequent developments strengthened our belief in this matter.

AGITATORS WERE IMPORTED

The United Mine Workers of America brought in about 30 agitators of different nationalities from outside the state, and these men did all they could for several months prior to September to inflame the minds of our employees and to persuade them to believe that they were being unfairly treated.

A convention was finally called in Trinidad on Sept. 16, 1913, which was attended by delegates purporting to come from our mines, but who really were brought in in a number of cases from other districts. At only one of our 21 mines was a meeting held and delegates sent from our property to the Trinidad convention. Delegates furnished by the leaders and who did not represent our mines, of course, were willing to vote for a strike.

The strike call was responded to by approximately 25 per cent of the miners in the Trinidad and Walsenburg districts. Immediately following the call, every means of intimidation known to the Mine Workers Union were used to force our men to quit work. This action resulted in another 20 per cent. leaving the collieries.

The strike was called on Sept. 23, and acts of intimidation began on Sept. 26 when hacks going to the mines were stopped by armed men and the passengers taken from the vehicles and forced to return to the railroad depots under threats of death. A considerable supply of firearms was bought and shipped into the district by the union leaders as early as ten days before the strike was called. A reign of terror was instituted by the Mine Workers Union, and the promiscuous shooting of people who were traveling in the direction of the mines, the burning and dynamiting of bridges on the railroads serving mine properties, and many other unlawful acts resulted in the Governor calling out the militia on Oct. 28.

MOST OF THE MEN RETURNED TO WORK

Immediately after peace had been restored the miners began to return and by the middle of January we had all the men needed to produce the coal necessary to fill our orders, and before the first of April we were losing time at some of the mines on account of shortage of orders.

The militia was withdrawn on April 16, and on April 20, the strikers resumed their lawless acts. They began by perpetrating assaults on different mining properties, attempting to massacre men at work and destroy properties with fire and dynamite. This, of course, finally resulted in the calling out of federal troops.

The deplorable happenings at Ludlow on April 20 and 21, which have been so grossly misrepresented in the press, were certainly not chargeable to the mine operators. The continual talk about armed thugs being used as mine guards is the veriest rot, as is also the stories circulated about shooting the women and children. There has not been a single striker's wife or child killed or molested by a mine guard. However, two children of one of our employees were shot by strikers while in their home at our Tabasco mine on Oct. 26.

WOMEN AND CHILDREN WERE SUFFOCATED

The women and children who lost their lives in the burning of the Ludlow tent colony were suffocated by being placed in a cellar under one of the tents and covered over by tight plank boards with mattresses thrown over the floor. This was done by strikers themselves in their ignorance of natural laws, and the women and children were suffocated not by the burning of the tents, but by the lack of air circulation in the hole in which they were placed by their would be protectors.

In the different stories sent out by the union and published in the newspapers of the country, there is no mention made of the wives and children of the five or six thousand miners who are now at work, and had it not been for the volunteer services of these men, many of our properties would have been destroyed in the recent reign of terror instituted by the strikers.

At all of our collieries our miners begged for means of protection and when it could be furnished, they willingly went out and assisted in driving back the strikers who were attempting to come in and murder their women and children and destroy our property.

MINES ARE OPERATING TO NORMAL CAPACITY

We have now practically all the men we can use in our mines, and while I am not certain that this condition prevails at the plants of all the other companies, I am sure that the Colorado operators as a whole could produce coal enough to fill their orders if they were left alone and not molested by men on strike.

Conditions are quiet at the present time, and our mines are working every day and will continue to do so as long as the authorities are able to prevent acts of violence on the part of the strikers. *It is absurd for the United Mine Workers to demand of us that we discharge or force into the union our loyal employees who have stood by us throughout the trouble and are satisfied with their working conditions.*

E. H. WEITZEL,
Manager of Coal Mines,
Colorado Fuel and Iron Co.

Pueblo, Colo.
May 19, 1914.

Handling the Negro Miner in the South

SYNOPSIS—This class of labor is naturally shiftless, being contented to let the morrow look out for itself. Laws should be passed prohibiting garnishments and compelling merchants and money lenders to look to the man rather than the company for payment. More frequent paydays are also advisable.

“A nigger is a colored person who has no money.”

The above is an epigrammatic definition of a class constituting from one-half to two-thirds of the labor at most coal-mining operations in the South.

The aptness of the definition will immediately appeal to those who are familiar with the negro and the treatment so generally accorded him around many Southern operations.

It is to be regretted that such a definition has any significance, but many will, upon reflection, admit that it is too true.

It is on account of the characteristic disregard of the negro for money beyond today's need, and the fact that, as a rule, he can hardly be induced to put in a full month's work, that the attitude of many operators is simply to make the best they can of his labor without paying any regard to the whys and wherefores of his shiftlessness or give any study to methods and measures that would keep him at work more steadily and make a better laborer of him.

It is not altogether the fault of the negro that he is so aptly designated as a “colored person without money.” There are a number of contributing causes, some of which the operator has direct control over and others which he can do much to minimize.

HIS CHECKS ARE OFTEN HEAVILY DISCOUNTED FOR CASH

The first cause and one which most operators control directly is the operation of commissaries and the issue of checks which can be traded there. These are too often, heavily discounted for cash before they get to the store. By nature the negro is glad to get hold of “real money.” When payday comes only once a month, the check window, which is usually open all day, is a constant invitation to him to draw his day's earnings, which he can either trade at the commissary or sell to ready buyers for cash, say 60 or 70c. on the dollar. Under the latter plan he loses a good percent. of his earnings, so as to enjoy spending what is left immediately.

In too many cases the commissary is an adjunct of coal-mining operations, not as a necessity to take care of laborers, but as a money-making proposition. In such cases, the company store is an absolute preventive against the acquiring of any ideas of thrift on the part of the workmen and causes them to live from hand to mouth.

Some operators will claim that this is the only way to handle negro labor. These officials go blindly forward on the assumption that the sooner the negro can get hold of and spend his money, the quicker he will get back to work. On the other hand, this theory has been disproved by the practice of many operators of running their commissaries simply as a plant necessity, supplying the best goods

at the lowest cost and getting their returns from increased tonnage mined by more contented workmen.

HOW THE NEGRO CAN BE ENABLED TO GET OUT OF DEBT

The negro can be cured of his natural shiftlessness if the “white folks” will help him. As far as the commissaries are concerned, this can be done by issuing store checks once or twice a week instead of every day and paying off twice a month. The negro after all likes to feel that he has a little ahead and like any other human being he likes to find some money in his envelope on payday. If you don't believe it, try it on him.

The greatest indirect contribution to the general shiftlessness of the negro and one that keeps him jumping from place to place, going to court, etc., is the ease with which he can be induced to borrow money, buy furniture, clothes, books and pictures, on the installment plan—in too many cases far beyond his means and at exorbitant rates and prices. In most of the Southern states the garnishment laws are such that as soon as he fails to make a payment, he is garnisheed and in most cases this means the holding up of his wages until he can either pay or secure a release, to say nothing of the costs which he must pay.

However, in some states even the existing laws covering garnishments will be found very effective in affording relief to the man who is garnisheed by a loan shark or installment furniture man, if the company will only help the man to help himself. For example, in one Southern state the law states plainly that \$25 of a man's earnings are exempt from garnishment, yet some operators honor garnishments served on their workmen without giving them the benefit of such exemption. It is not enough to fire a negro for being garnisheed. He simply moves and goes to work at another place, but the man he owes trails him and garnishees him again.

GARNISHMENT LAWS SHOULD BE CHANGED

The remedy for the garnishment evil is to remove the trouble at the source. This can be done in some cases by taking advantage of existing laws, and in others by taking steps to secure better laws. People will quit lending money at illegal rates and selling furniture, clothing, etc., at extortionate prices when they learn they must look to the man and not the company for payment.

It is pleasing to note that all over the South, people are learning that it pays to give the negro every chance to improve his condition, and that when this is done he becomes a better workman. There is plenty of room for improvement yet, and especially will coal-mining people find that it pays to conserve the earnings of negro workmen rather than feed and fatten on them.

There is reason to believe the day is not far distant when our epigram will have lost most of its significance. There is no doubt its coming will mean increased production and profit for the coal-mining concerns, for the negro will work harder to save money than he will to pay an unfair debt incurred to buy something he no longer wants.

A Modern Kentucky Plant

BY R. J. SAMPSON*

SYNOPSIS—A small but well equipped plant and coal washery in the Cumberland Gap Coal Field of Kentucky. The double-entry room-and-pillar system of mining is employed.

The mines of the Yellow Creek Coal Co. are located at Bosworth, Bell County, Kentucky, in what is known as the Cumberland Gap Coal Field. They are some 5 miles west of Middlesboro and are reached by a branch of the Louisville & Nashville R.R., over which the Southern Ry. also has track rights.

Analysis of the Sandstone Parting coal shows: Moisture, 2 per cent.; volatile matter, 33; fixed carbon, 57; ash, 7.2; sulphur, 0.55 per cent.

The lower or "stray" seam has a thickness of 36 in. clean coal. No analysis of a sample taken at this mine is available.

The Deane seam is 4 ft. 2 in. thick, clean, with the exception of a very thin stratum of soft clay near the top.

Some 40 ft. over the Poplar Lick is the Klondike seam. Its average thickness is about 4 ft. 6 in., with a shale parting some 2 ft. from the bottom, which varies greatly



GENERAL VIEW OF POWER PLANT AND WASHERY

The company first began operations in the Poplar Lick and the Sandstone Parting seams, these two being opened at the same time. Coal was first shipped in January, 1902.

These two seams, only, were worked until 1912, when another bed, some 750 ft. below the Sandstone Parting coal, was opened. This has not been satisfactorily correlated, but is believed by some authorities to be the Straight Creek seam.

In 1913 development of the Deane seam, on the north side of the hollow, was begun. The Poplar Lick seam, at an elevation of approximately 2500 ft. above sea level, here shows a section of 4 ft. 6 in. of clean coal.

Analysis of this coal is as follows: Moisture, 4.46 per cent.; volatile matter, 33.57; fixed carbon, 60.12; ash, 1.43; sulphur, 0.52 per cent.

The Sandstone Parting coal, some 700 ft. below the Poplar Lick, has an average thickness of 48 in. One foot from the bottom there is a sandstone parting some 4 in. or 5 in. thick.

*Middlesboro, Ky.

in thickness. The Yellow Creek company has as yet done no work in this measure.

THE DOUBLE-ENTRY ROOM-AND-PILLAR SYSTEM IS USED

In all of the mines the ordinary double-entry room-and-pillar system of mining is used. Fans have been installed at all but the newest of these openings. On the south side, in the two old mines, the air is not split, but in the lower mine on that side and in the mine on the north side splitting of the air is accomplished by means of overcasts—a split being made for each cross-entry.

In the two new mines, the coal is undercut with short-wall chain cutters, two Sullivan, one Jeffrey and one Goodman machine having been installed for this purpose. In the other two mines the coal is undercut by hand.

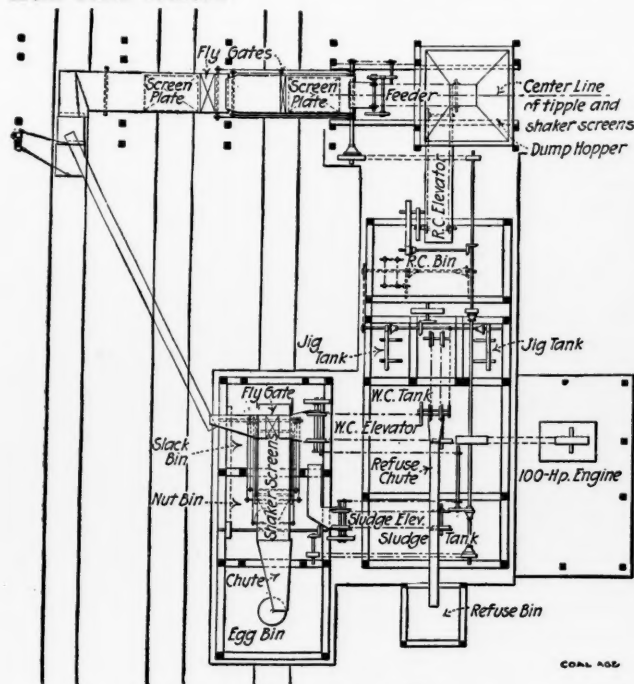
Three 7½-ton Goodman electric locomotives comprise the haulage equipment.

From the Poplar Lick seam the coal is lowered by means of a retarding conveyor of the rope and disk type. The conveyor trough is 36x18 in., the disks being attached to a 7/8-in. wire rope, on 4-ft. centers. The capacity of this conveyor is 100 tons per hour. It dis-

charges into bins, from which the coal, together with that from the Sandstone Parting seam is loaded into 8-ton monitors. These acting on a gravity incline, also carry the coal from the lower seam.

On the north side of the hollow, monitors also handle the coal to the same tippie as that from the south side, but onto a separate dump. All of the coal passes over the same screens. Up to the present time, it has been possible to load only three sizes of coal at one time, the tippie having been provided with but three railroad tracks.

For several years the company has had a contract with the Southern Ry., which practically covered its entire output. This contract will expire during 1914, throwing the coal on the open market in competition with that from other sources.



LAYOUT OF TIPPLE AND WASHERY

Immediately under the lower seam there is a thin stratum of clay, which comes up with the coal; this, together with some of the parting in the Sandstone Parting bed, makes it imperative that it be mechanically washed.

To accomplish this, there was recently begun the construction of the most complete and largest washing plant which has yet been built in this section. It has a capacity of 1200 tons per day and was designed and built by the Pittsburgh Coal Washer Co.

The coal is dumped as before and passes over a 4-in. screen. The screenings go into a chute to the boot of the "raw-coal" elevator, while the oversize is loaded at the tippie as block coal.

Under the 4-in. is placed a 2½-in. screen. By means of a fly-gate, the oversize from this screen may or may not be passed into the chute, which feeds the raw coal elevator, i.e., in case it is not necessary to wash this size, it can be loaded at the tippie as egg.

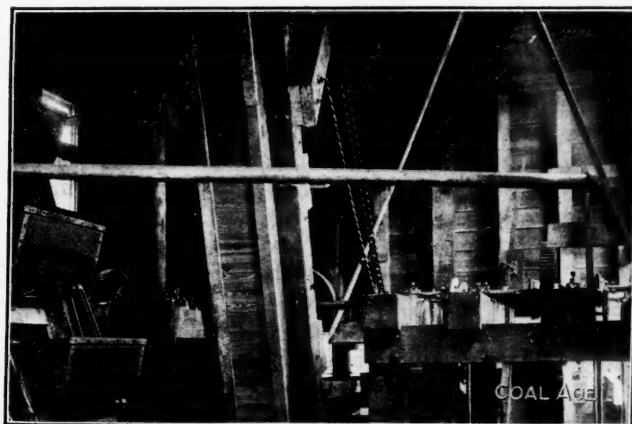
From the raw-coal elevator, the material is passed down through a "retarding tower" into a bin. An opening on each side in the bottom of this bin supplies raw coal to conveyors, which feed two Pittsburgh jigs of a guaranteed capacity of 50 tons per hour each.

From the jigs it is carried to the screens at the top by the washed-coal elevator. Waste from the washers is carried by the refuse elevator to a chute, which empties into a bin on the outside of the building.

At the screens are made three grades of fuel, slack, nut and egg. The nut and egg sizes are lowered into bins by means of spiral lowering chutes, which prevent breakage. In case a run-of-mine product is desired, there is provided a chute from the screens back to the tippie bins, which carries all of the washed coal and loads it with the block at the tippie track.

The bin gates are cast with a hollow rim provided with openings for pipes. Steam is circulated through this rim to prevent freezing of the water which, of course, collects at the lowest point.

The chutes just below the gates are provided with openings, through which is circulated the cleanest water available. The finer particles thus taken out pass to a hopper,



VIEW ON THE JIG FLOOR

thence by means of a chute to the sludge elevator and thence to the sludge tank and slack bin. The nut and egg sizes are loaded from the chutes by movable loaders.

THE POWER PLANT

The boiler house is equipped with two batteries of two 150-hp., fire-tube boilers each. One battery is held in reserve. In the engine room a Ridgeway duplex engine drives a 300-kw., General Electric generator, by belt connection. A Houston-Stanwood, 100-hp., duplex engine furnishes power for the washer. It operates on 100-lb. pressure at the throttle.

A camp of 152 comfortable cottages shelters some 200 employees. There will be added shortly 75 to 100 men, materially increasing this force. A well stocked company store supplies the camp with all of the necessities and not a few of the luxuries of life.

At present the output is from 400 to 500 tons per day, but this will probably be increased in a few months to from 800 to 900 tons daily. To run the washer at its full capacity of 1200 tons, an approximate total output of 1700 tons would be required.

The coals of this district are gradually getting onto the market in the North and Northwest. The opening of the Panama Canal should divert no little West Virginia fuel which is now being shipped into that section, thus creating a greater demand for the product of this field, a demand which the operators here are preparing to supply satisfactorily.

The Economy of Machine Mining

BY WESLEY S. HARRIS*

SYNOPSIS—The difficulty of obtaining accurate figures on which to base a just comparison of the cost of machine-mined and pick-mined coal. The need of carefully considering the peculiarities of the coal seam and all the conditions affecting the mining of the coal. A brief review and classifications of charges, including a due regard to danger of accident due to use of machines for cutting the coal; breakdowns, opposition of men to installations, etc.

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This is a question of vast importance to the mining industry of the country and especially so in Indiana at the present time inasmuch as the miners in joint convention with the operators at Terre Haute have just demanded that the differential between pick-mined and machine-mined coal be reduced to 7c. per ton. As yet, however, it has received little or no consideration by operators and mine managers. Absolutely accurate figures are not obtainable, because accurate data are not available. Comparison is an argument, but fails to establish a fact because of varying conditions. Items of cost that should properly be charged to the production of machine-mined coal are, oftentimes, charged to another account, or to the production as a whole where the coal is part machine-mined and part pick coal, thus affording an opportunity for serious error in judgment.

Coal operations are in many particulars analogous to the high cost of living about which we hear so much, in that we as mine managers, in many instances, fail to produce dividends for our companies on account of our zeal to own or operate so called modernly equipped mines. In this age of efficient apparatus, it is, of course, necessary to be uptodate and abreast of the times in order to successfully compete with the live wires of our business; but this does not necessarily mean or imply that all mines must be equipped with mining machines in order to be modern.

COST OF EQUIPMENT JUSTIFIED

Mining machines and the necessary equipment for successfully operating them at the average colliery cost an immense amount of money. If money is injudiciously spent in equipping a plant for cutting coal with machines, overhead charges for interest, maintenance, depreciation and taxes will be correspondingly heavy. Conditions may justify the expenditure in order to properly recover certain coals and at the same time safeguard life and property; but such moneys should be judiciously and wisely expended and then only after exhaustive analysis of conditions surrounding the proposed operation. The fact that one's neighbor mines his coal with machines is not sufficient reason for one to so equip his own property. Usually each mine, and especially each coal, has its peculiarities that deserve careful consideration. Many pointers and suggestions that are worthy of serious deliberation may be had from the man at the face. Such pointers and suggestions only cost when ignored or neglected.

It is fair to assume that all uptodate companies main-

*Superintendent, Little Giant Mine, Monon Coal Co., Linton, Ind.

tain accounting systems that are a criterion by which they may determine approximately the relative costs of pick-mined and machine-mined coal; and it would appear from the large number of machines in operation that opinion is practically unanimous in their favor. However, there are many angles that afford viewpoints not generally considered in this connection, a few of which it will be the purpose of this article to now briefly enumerate in order to open a discussion of the matter by readers of COAL AGE.

CLASSIFICATION OF CHARGES

The writer submits that interest on investment, maintenance, depreciation and taxes on all extra equipment over that necessary for the successful operation of the property as a pick mine should properly be charged to machine-mined coal. In this list should be included all extra housing, boilers, boiler settings, boiler fittings and accessories such as feed pumps, steam headers, etc., in addition to generating units, settings, switchboards and accessories, transmission lines and machines. Further, also, under the head of supplies should be included and charged to machine-mined coal all extra repairs, fuel, water, oil, tools and office supplies over and above that necessary for the successful operation of the property as a pick mine; and under the head of labor, should be included and charged to machine-mined coal all extra expenditures for electricians, wiremen, firemen, oilers, jerries, drivers, tracklayers, bit sharpeners or blacksmiths and clerical force over and above that necessary for the successful operation of the property as a pick mine.

It will be readily conceded that all extra expenditures for electricians, wiremen, firemen and oilers should properly be charged to machine-mined coal, however, it may be well to call attention to the fact that jerries are quite frequently required to timber after machines, clean slate and refuse at switches and turns on account of the additional space required for machines to turn; extra drivers are frequently necessary due to the fact that they are required to get sharp bits to the machines and dull bits to the shop, must occasionally await the moving of a machine thereby losing time and in most mines in Indiana must drive further for their loads or past one extra place out of every three, due to the fact that three working places are allowed each two loaders; extra track layers are frequently required for the same reason, viz., that they have more track to keep up and over a larger territory due to the fact that three places are allowed two loaders; bit sharpener or extra blacksmith should properly be charged to machine-mined coal where the machine men are not charged for smithing; clerks, purchasing agents, accountants and bookkeepers will readily call to mind countless hours that have been spent in ordering machine supplies, checking freight bills and keeping track of supplies. Delays and shutdowns due to trouble with boilers or generating units should properly be charged to machine-mined coal where machines are responsible for such trouble. Many of us have experienced delays in both hoisting and haulage due to our generating plants being overloaded by reason of having been required to put ad-

ditional machines in operation when the generating plant was already working at or above its rated capacity.

DANGER OF ACCIDENTS CONSIDERED

All expenditures for personal injuries directly due to mining machines or transmission lines used exclusively for supplying power to mining machines should properly be charged to machine-mined coal as should also all expenditures or loss by reason of mules or horses being killed by such transmission lines. While discussing this phase of the subject, it may be well to call attention to the matter of accidents in general. The fact is well recognized by many mining men that there is more danger from falls of coal, roof and drawslate where machines are used than in pickwork. This is undoubtedly due to the fact that the charge of powder is placed nearer to, against or in the roof, in the case of machine work, where the shattering effect of the charge is greater on the cover than when a larger charge is placed more remote from it. This is of great importance when we consider the large proportion of accidents from these causes. This is emphasized by quoting John Dunlop, state mine inspector, third district of Illinois, as reported on page 984 of *COAL AGE*, June 28, 1913, wherein he says: "It is true that more powder is used where coal is being shot off the solid and it is probable that the roof is affected by the heavy shooting, but careful perusal of the reports of the state inspector of mines shows that 60 per cent. of the men killed by falling coal, roof and drawslate are struck down in mines where the coal is almost all undercut by machines. As these mines produce only about 52 per cent. of the total output, it seems that they have an undue proportion of accidents, and it is not fair to ascribe the maintenance of rate or increase in accidents to shooting out of the solid."

With respect to the recovery of coal, it may be said that the machine has proved to be an advantage, but even this will be a difficult matter to substantiate when we take into consideration the fact that machine bottoms are seldom taken up by the loader and when machine men make their own bottoms, they leave from 2 to 8 in. of coal. The coal is thus not only lost, but the working thickness of the seam is decreased by reason of the bottom coal being left.

We pass the matter of loss on powder sales without comment, due to the fact that the price to the miner has remained the same for several years while the operator has been required to pay more and more for it each year until at the present time the margin of profit is small.

The writer is of the opinion that it is possible to maintain a more regular output at pick mines than at machine mines unless the operation has a surplus of both miners and working territory. Machine breakdowns are largely responsible for this situation. If we maintain an excess of machines and territory in order to offset such a condition, it requires an additional investment.

Last, but not least, is the matter of the good will of employees. The writer holds that the mining machine, even in its most perfected state, is responsible for much of the dissatisfaction, discontent and labor trouble around mines. There are many reasons for this conclusion which must be manifest to all mine managers. Probably the most important of these is that men are oftentimes thrown idle for a day or days by reason of being out of coal due to the machine being broken or the machine men being out.

The fact that three of the sixteen demands presented to the operators by the miners of Indiana would tend to decrease the differential between pick and machine coal is significant.

Deeper Mining More Dangerous

The official figures of the accidents in the anthracite mines of Pennsylvania, in the last annual report of the Department of Mines, just published, show a marked improvement over those of the previous year, but the report also carries a warning. Of the 615 accidents that occurred inside the mines in 1911, 337, or 54.7 per cent., were attributed to the carelessness of the victims themselves, 45, or 7.31 per cent. to the carelessness of others, and 233, or 37.89 per cent., to unavoidable accidents. In 1912 there was 498 accidents, or 117 less than in the previous year, but of these 322, or 64.66 per cent., were attributed to the carelessness of the victims themselves, 32, or 6.43 per cent., to the carelessness of others, and 144, or 28.91 per cent., to unavoidable accidents.

Thus it would seem that the mine workers are growing more careful of others, but also more careless of their own safety. In this connection, Chief James E. Roderick, of the Department of Mines, writes:

"If the accidents resulting from carelessness and disobedience of rules could be eliminated, the fatalities in the mines would not be greater than in many vocations in the cities.

"The work of the coal miner becomes more dangerous as the operations grow more extensive and attain to greater depth. This has become apparent in recent years to mining officials and other persons interested in mining, and has created a demand for stricter and more modern legislation and for the adoption of the most approved means and methods for the protection of human life."

Cost of Maintaining Strikes During the Year 1913

SPECIAL CORRESPONDENCE

In his annual report for the year 1913, submitted to the International Convention of Miners at Indianapolis, in February of this year, Secretary-Treasurer William Green makes the following statement:

On account of the strong opposition of the coal operators and their friends, in the non union fields, we have been forced to spend large sums of money.

During the year 1912 we spent..... \$706,225.20
For 1913 for relief alone..... 1,621,942.67

Total for the two years..... \$2,328,942.87

The amount spent for aid in the year 1913 was distributed as follows:

District No. 7 (Penna Anthracite).....	\$600.00
District No. 8 (Block Coal Indiana).....	9,400.00
District No. 10 (Washington).....	20,000.00
District No. 13 (Iowa).....	986.43
District No. 15 (Colorado).....	661,600.00
District No. 17 (West Virginia).....	318,600.00
District No. 19 (Tenn. & Kentucky).....	2,832.75
District No. 20 (Alabama).....	4,134.16
District No. 23 (Kentucky).....	8,500.00
District No. 28 (Vancouver Island).....	584,000.00

Miscellaneous expenditures were as follows:

American Federation of Labor tax.....	\$56,337.18
Salaries and expenses, officers, organizers and employees, for 1913.....	290,764.09
Supplies.....	4,431.95
Office expenses.....	7,161.98
Printing.....	12,589.72
Telephone, postage and express.....	5,307.45

The report summarizes

Total income.....	2,159,031.69
Total expenditures.....	2,102,261.44
Balance on hand.....	\$ 278,032.30

The above items furnish interesting food for thought in connection with the article on Lessons of the Vancouver Strike, published in our issue, May 16, p. 801.

Efficiency and the Purchase of Power in Coal Mining

BY A. E. GREGORY*

SYNOPSIS—Purchasing power usually awakens the coal-mine management to the possibilities of saving good money in the use of current. While these possibilities undoubtedly exist and might be taken advantage of under private supply the significant fact remains that this is seldom done.

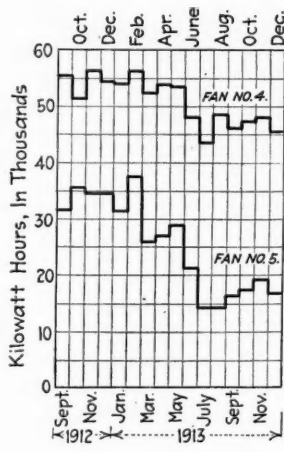
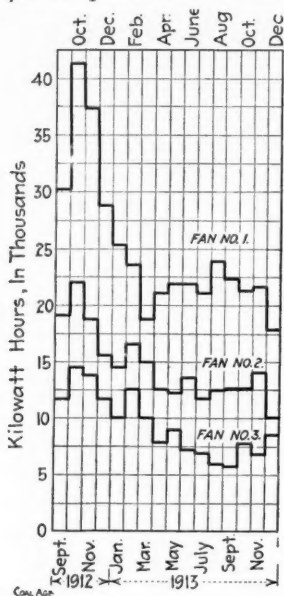
There is one phase of the use of central-station power which has not received the consideration which it deserves; that is, its bearing upon operating efficiency or what might be called its "moral effect."

With the introduction of central-station power in the various industries in place of that supplied from private power plants there has been observed a tendency to

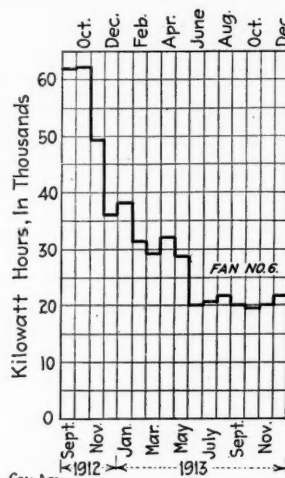
station. With private-plant operation the manager rarely knows even approximately the cost of power; when buying it, however, it is impossible that he should be ignorant of its cost since every power bill is a reminder.

CONSIDERABLE SAVINGS ARE SHOWN

The accompanying charts give a graphic representation of results actually secured in the saving of power as applied to the ventilation of a number of mines in the Pocahontas coal field, following the change to central-station power, which took place in August, 1912. Prior to this time these fans had been electrically operated from private plants. The power consumption for the first few months following the change in supply may be regarded as fairly representing that which obtained prior to the purchase of current and the progressive economies of power are clearly indicated. Comparing the consumption for the last four months of 1912 with that for the cor-



CHARTS SHOWING DECREASING POWER REQUIREMENTS OF FANS NOS. 1 TO 5 INCLUSIVE



CHARTS SHOWING DECREASING POWER REQUIRED BY FANS NOS. 6 AND 7.

greater efficiency in the use of current. Wasteful methods long tolerated under operation from private plants give place, in many cases, to a regimen of careful economy in the use of power.

Probably few situations offer greater possibilities for improvement in this respect than the average coal mine as operated from its own plant. Coal is cheap and, consequently, little thought is given to economy in the use of power. Moreover, this attitude is largely justified inasmuch as any saving in current consumption can reduce the power costs but little except as regards the single item of fuel, since labor, interest, depreciation and other so called fixed charges remain practically the same in any case.

With the employment of purchased power on the other hand any economies in its use show a much greater proportionate saving in money and, what is of more importance as an incentive to economy, the entire cost of power is represented in the monthly bill rendered by the central

responding period of 1913, the reduction in the cases of five of the seven fans represented varies from 40 per cent. to over 60 per cent., while for the other two the reduction was 34 per cent. in one case and 14 per cent. in the other.

These economies were secured by a variety of means. In several cases where fans had been operated at constant speed 24 hours per day, and where the conditions permitted of operation at a reduced capacity at night, the old motors were replaced with those of the two-speed type which permitted the rapidity of rotation to be reduced one-half. As a reduction of 50 per cent. in the speed of a fan reduces the power required by about 80 to 85 per cent., this change in itself accounts for a large part of the saving of power.

In some cases there was found to be considerable waste of power in the short-circuit of air currents as a result of leaky brattices between the air courses and the haulage ways. The remedy was obvious and inexpensive. In one or two cases the air delivery was found to be larger than was necessary or desirable, and in these instances the re-

*Appalachian Power Co., Bluefield, W. Va.

duction of fan speed resulted not only in a saving of power, but in a lessened tendency to dust disturbance by reason of the reduced air velocity.

POWER SAVING IS NOT RESTRICTED TO FANS

The saving of waste energy has not been limited by any means to the operation of mine fans. The power consumption for haulage and cutting and even for pumping has been materially reduced although the results cannot

devices have been superseded in most cases by some form or other of electrically operated "grab" or "clam shell" suspended and actuated either from a crane or monorail carried on an overhead framework.

The accompanying illustrations show some of the many applications of this principle to industrial practice. Fig. 1 shows a gantry crane employed for the unloading and storing of coal from railroad cars. Fig. 2 shows the adaptation of the suspended grab bucket to the coaling



FIG. 1. GANTRY CRANE WITH GRAB BUCKET FOR UNLOADING AND STORING COAL

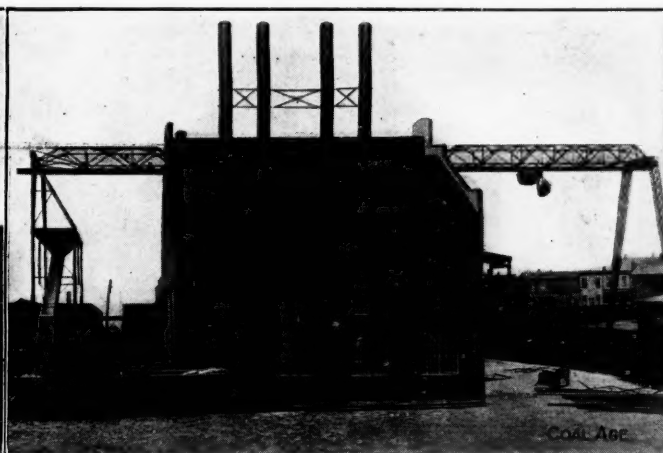


FIG. 2. A GRAB BUCKET ARRANGED TO DELIVER COAL TO AND REMOVE ASHES FROM A POWER PLANT

so readily be demonstrated as in the case of ventilation, owing to the more variable nature of the load.

Of even more importance perhaps than the saving in power consumption, as a result of the improvements in distribution and use of power, may be the improved performance of the operating equipment. Defective bonding, for instance, not only entails loss of power, but what is worse, is likely to cause overheating of such equipment as locomotives and cutting machines, thus reducing their working capacity. It may easily happen, therefore, that improvements having as their object simply the reduction of the power bill will result in other benefits of even greater value.

While it is true that the economies described in this article could have been effected quite as well in connection with power service from private plants, the significant fact is that they were not thus secured. Indeed, it is doubtful if the possibilities of economy were even suspected until after the purchase of current. Moreover, the cause of the newly awakened interest in power economy is not that the purchased energy costs more; on the contrary, even for equal power consumption the costs usually are less than under private plant operation.

No, it is not that the cost of power is higher than before but simply that it is now known, whereas before it was not. As one operator expressed it, "Your meter is the best boss I have."

■

Handling Coal Electrically

The loading or unloading of granular material in bulk such as coal from cars or boat and its transportation to some nearby point is today seldom accomplished by manual labor. For unloading particularly, the laborer with his wheelbarrow, the horse hoisting a bucket and similar

of a power plant. In this case the track or trolley passes entirely through the building and is so arranged that the same apparatus that supplies coal to the bunkers from the right discharges ashes from the left of the building to railroad cars.

Fig. 3 is a general view of a grab bucket and monorail tram for unloading coal or other granular substance and conveying it or other material about storage yards or works. Fig. 4 shows the bucket and traveler in greater

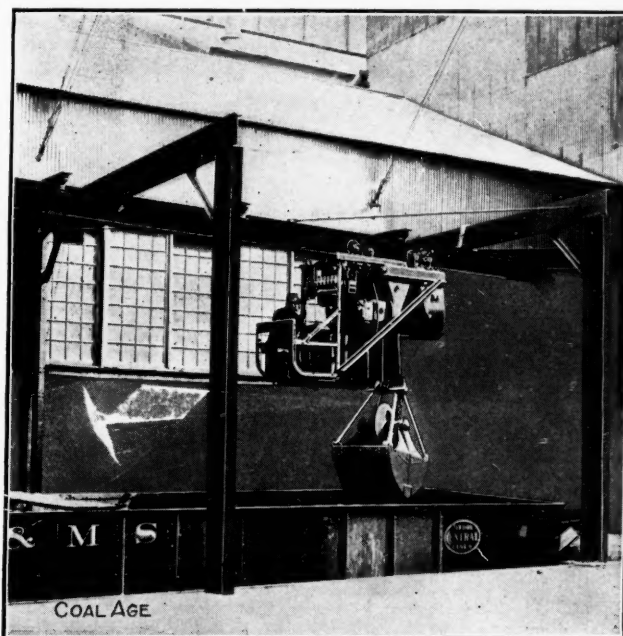


FIG. 3. A GRAB BUCKET, OPERATED FROM AN OVERHEAD MONORAIL

detail. It will be noted that the operator sits in a cab on the traveler and rides back and forth with it. He is thus enabled to see all that goes on at both traveler and bucket. He can, therefore, place the latter in the most advantageous position to pick up its load or to discharge its contents at any point desired.

In the case of the equipment above illustrated the trolley rail is a 15-in., 42-lb. I-beam, the bucket has a

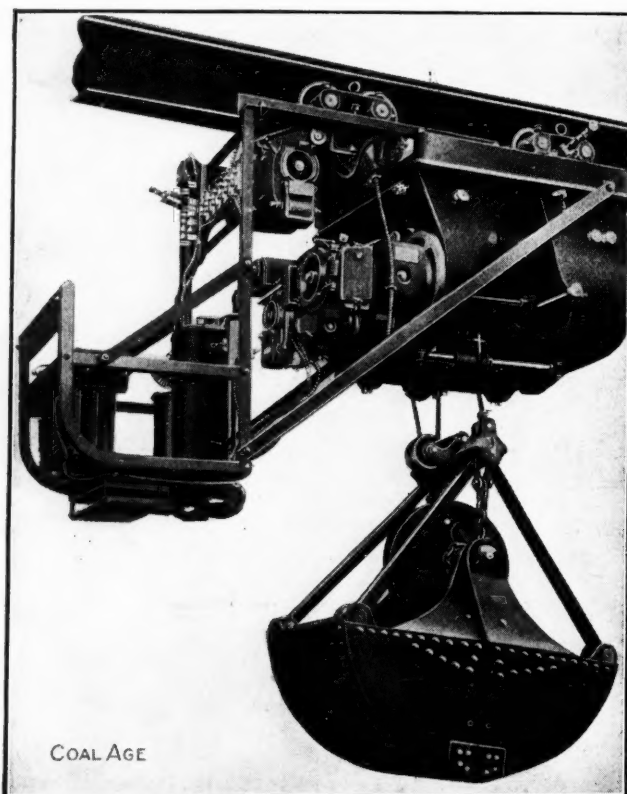


FIG. 4. NEAR VIEW OF GRAB BUCKET AND TROLLEY

capacity of $1\frac{1}{2}$ cu.yd. and the total weight of bucket and trolley is 13,000 lb. The full bucket may be hoisted at the rate of 150 ft. per min. and travel along the track can be accomplished at the rate of 350 ft. to 700 ft. per min.

Choosing a Trade in Pennsylvania

If you want to make money as a wage earner in Pennsylvania, get a job in a tin-plate factory. Your average daily wage will be \$3.10, your annual income \$837, and you will work 270 days in the year. These figures were compiled, for the benefit of those about to choose a trade, from the last Annual Report of the Secretary of Internal Affairs of Pennsylvania.

If you covet more leisure and want to earn the third largest average daily wage in the state, get a job in the anthracite mines. Your average daily wage will be \$2.60, your annual income \$605.80, and you will work only 233 days in the year. Your choice of a trade depends on whether you prefer a high daily wage, maximum annual income, or fewest working days.

In order to present these alternatives graphically, tables have been worked out from the above mentioned

Annual Report, covering the nineteen industries in Pennsylvania, each of which pay out over \$4,000,000 a year in wages to employees. In the first table, showing the average daily wage, the manufacture of tin plate leads with a daily wage of \$3.10, the manufacture of pig iron comes second with a daily wage of \$2.66, and anthracite mining comes third with a daily wage of \$2.60. In the second table, showing the number of working days, anthracite

AVERAGE DAILY WAGE OF ALL WAGE EARNERS EMPLOYED IN THE NINETEEN LARGEST INDUSTRIES IN THE STATE OF PENNSYLVANIA

1	Tin plate	\$3.10
2	Pig iron	2.66
3	Anthracite mining	2.60
4	Steam and electric locomotives	2.50
5	Iron and steel, rolled into finished form	2.43
6	Bituminous mining	2.35
7	Iron and steel, ingots and castings	2.28
8	Cars and car wheels	2.24
9	Furniture	2.03
10	Electrical supplies	1.96
11	Machinery	1.91
12	Hats	1.86
13	Cement	1.80
14	Carpets and rugs	1.69
15	Cotton goods	1.56
16	Boots and shoes	1.47
17	Yarns	1.35
18	Silk	1.22
19	Hosiery	1.21

AVERAGE NUMBER OF DAYS WORKED IN THE NINETEEN LARGEST INDUSTRIES IN THE STATE OF PENNSYLVANIA

1	Anthracite mining	233
2	Pig iron	237
3	Bituminous mining	248
4	Furniture	262
5	Tin plate	270
6	Carpets and rugs	277
7	Yarns	282
8	Silk	284
9	Iron and steel, rolled into finished form	286
10	Iron and steel, ingots and castings	289
11	Boots and shoes	289
12	Hosiery	289
13	Hats	291
14	Cement	292
15	Cotton goods	293
16	Steam and electric locomotives	300
17	Machinery	301
18	Cars and car wheels	302
19	Electrical supplies	304

AVERAGE ANNUAL INCOME OF ALL WAGE EARNERS EMPLOYED IN THE NINETEEN LARGEST INDUSTRIES IN THE STATE OF PENNSYLVANIA

1	Tin plate	\$837.00
2	Steam and electric locomotives	750.00
3	Iron and steel, rolled into finished form	694.98
4	Cars and car wheels	676.48
5	Iron and steel, ingots and castings	658.92
6	Pig iron	630.42
7	Anthracite mining	605.80
8	Electrical supplies	595.84
9	Bituminous mining	582.80
10	Machinery	574.91
11	Hats	541.26
12	Furniture	531.85
13	Cement	525.60
14	Carpets and rugs	468.13
15	Cotton goods	457.08
16	Boots and shoes	424.83
17	Yarns	380.70
18	Hosiery	349.69
19	Silk	346.43

mining has the minimum of 233 days, the manufacture of pig iron is second with 237 days, and bituminous mining third with 248 days. In the third table, showing the annual income based on the product of the first two, the manufacture of tin plate leads with \$837, the manufacture of steam and electric locomotives is second with \$750, iron and steel, rolled into finished form, is third with \$694.98, while anthracite mining with its many holidays and more abundant leisure has fallen to seventh place with \$605.80.

It is claimed that the adoption of the hydraulic system of stowing wastes would be beneficial in many directions. There being no loose wastes or gobs, a reduction in the loss of "effective" ventilation would accrue. There would be less liability of explosions. The risk of falls would be reduced, owing to the more substantial support afforded the roof. Again, collieries would be more sightly if we put back into the worked-out places of the mine the material drawn therefrom in the process of working. The waste at present goes to form the huge, unsightly culm piles so frequently seen on the surface near coal mines.

Electricity in Coal Mining

By DAVID R. SHEARER*

SYNOPSIS—This is the third article of the series on this subject. Explanations and diagrams are given of the various electric signaling systems prevalent in coal-mining operations.

Since the earliest days of mine operation, it has been necessary to have some method of communication between those employed on the surface and the men working underground. At first these methods were very crude, taking the form of mechanical bells or gongs, operated by a system of wires from the bottom of the shaft by a series of jerks or pulls from handles located at some convenient place. Later we find the first simple electric system, consisting of one electric bell and one push button, using either two wires, or one wire and a ground return to complete the circuit.

A system of this type in its simplest form is shown in Fig. 1. Communication was carried on over the wires by means of a system of signals, in some instances, this being the Morse telegraph code. After some time this simple bell service was made more efficient by adding additional buttons and additional bells to the same circuit,

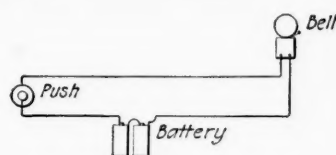


FIG. 1. SIMPLE BELL SIGNAL CIRCUIT

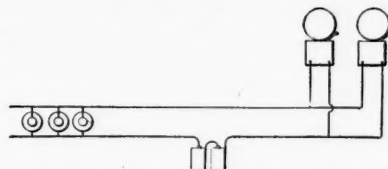


FIG. 2. MULTIPLE-BELL SIGNAL SYSTEM

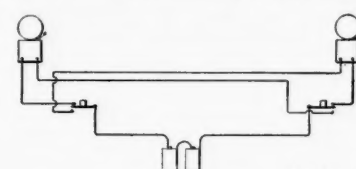


FIG. 3. RETURN CALL BELL SYSTEM

forming a multiple system, Fig. 2. We next find the return-call method of wiring being used with a bell and push button at each end, thus, either station could signal the other without ringing the local bell, Fig. 3. This system may be used with three wires or two wires and a ground return.

All of these arrangements work satisfactorily for short distances. But as extensions were made, adding more resistance to the line and increasing the number of points at which leakage might take place, it was found necessary to employ a great number of batteries in order to force sufficient current through the line wires to adequately operate the electric bells. This difficulty was overcome by two methods, each of which, however, added a certain amount of complexity to the operating system.

One of these methods consisted in the use of mechanical gongs, which contained a heavy clock spring operating the bell, together with a very delicate release mechanism, operated by a magnet, Fig. 4, through which a weak line current was passed. The electricity, although not of sufficient force to ring the bell, could nevertheless release the mechanical spring so as to operate the hammer striking the gong. This system operated very well if the springs were kept wound up, but frequently those in charge neglected the winding, in which case, of course, no signals could be received.

RELAYS MAY BE INTRODUCED

To obviate this difficulty, electric relays were introduced. The operation of this system is as follows: The

weak current from the line is passed through a magnet coil which actuates a delicate pivoted contact which in turn opens and closes a local circuit operating an electric bell, Fig. 5. In this case one battery is required for the line and another for each local bell section. Practically all modern systems of bell wiring used for great distances are operated on this principle and almost an infinite number of arrangements are possible and many complicated systems are in use at the present time.

One of the advantages of using relays on the line is that a closed-circuit relay may be used and the bell operated only when the current passing through the line wire is interrupted. Thus, the system automatically makes known any trouble arising from a break in the line wire from bad contact or from failure of the line battery.

Several sources of power are available for operating bell systems. The earlier signaling arrangements used wet cells almost exclusively, the Leclanche type for open-circuit line work and for local bells and the gravity or blue-stone type for closed-circuit line work. Owing to their convenience and adaptability, dry cells are used to a large extent in many of the smaller mines, while storage cells

are employed in many of the larger operations. Where alternating current is available, a low-voltage transformer can be used with marked success, especially for local bell work. These transformers require a very small amount of power, which is taken directly from the line wires furnishing light. A transformer, however, cannot be used on a direct-current system, although the storage battery used on the bell system may be charged from direct-current lighting mains, thus avoiding the recharging and upkeep found necessary with ordinary wet cells.

Many types of wiring are used in running from one part of the mine operation to another, each method probably having some favorable points. Perhaps the most common practice is the use of bare iron telephone wire, supported on porcelain knobs, though insulated wire fastened to the woodwork by staples is sometimes employed. The chief objection to this method lies in the fact that dampness or moisture gathering on the wires allows a leakage of current and sometimes short-circuits the system entirely.

Neither method is applicable if many wires are to be used as too much room is occupied by the lines and their supports. In case several wires are to be used and especially where space is limited, as in a small shaft or tunnel, it is advisable to use a cable containing the number of wires required. In dry places, this cable may have a weatherproof braid insulation, but where dampness is prevalent, it becomes necessary to further protect the wires from moisture by an additional covering of lead.

TELEPHONE WIRING IS EMPLOYED ABOVE GROUND

Outside the mine or on the surface the wiring methods usually used are similar to those employed in telegraph or telephone work, consisting of poles, cross-arms, insulators and iron wires.

Probably the best of all known methods of communication between the different parts of the mining operation is by the use of mine telephones. If these are properly installed, and the wiring carefully done, the system is almost trouble proof. The telephones are usually inclosed together with the battery necessary for their operation in waterproof iron boxes. The cable is lead covered and waterproof throughout. Several of these phones may be used on one line, and an easy method of communication established between numerous points in and around the mine. In some instances an inter-communicating system is used, whereby any one station can call any other station without interfering with those remaining or even ringing the bell of any but the one called. This system is especially common in large mining operations where it is frequently necessary to talk between the different offices, store rooms, or supply houses.

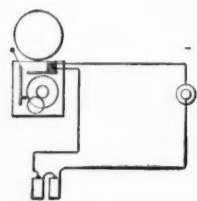


FIG. 4. ELECTRICALLY RELEASED MECHANICAL BELL

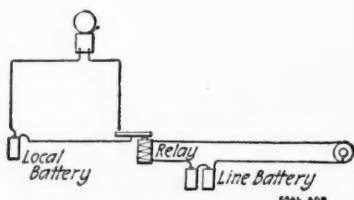


FIG. 5. RELAY OR DOUBLE-CIRCUIT ELECTRIC SIGNAL SYSTEM

A mine telephone, in underground work, is especially useful at the time of a fall or explosion in the mine, for if any men are imprisoned in the workings they may be able to notify those on the surface of their condition and give such directions as might be of assistance toward their release.

Another system of wiring which is coming into some use is that of the automatic fire alarm. This system contemplates the use of many contact-closing thermostats, located at different points of the operation where danger of fire might be expected. In the event that a fire does occur, the heat communicated to these thermostats closes an electric circuit and rings a bell used for fire purposes only.

To adequately cover the many methods of signaling used in mines would require several volumes and a brief outline only is given of the ordinary methods in use. It is to be noted, however, that much time may be saved and sometimes even life and property preserved by the use of carefully erected signal systems. To secure the installation of an outfit suitable for the use of the given mine, the services of an engineer are usually to be required, as frequently the owners are not sufficiently acquainted with the methods available to determine the most suitable or efficient installation.

A MAP SHOULD BE MADE

After such a system is installed and thoroughly tested under working conditions, a map should be drawn, showing the methods of wiring, the location of the batteries,

sources of power and the exact position of every station. This diagram should not only be kept in the office of the superintendent, but should be posted up in the power house. At regular intervals an electrician should thoroughly test every part of the equipment, determining at the same time the strength of the batteries, if batteries are used, and their probable life. The man whose duty it is to inspect such a system should be required to furnish a written report, noting any defects or variations from normal operation. If defects exist, they should be remedied at once, as at any moment the satisfactory operation of bells or signals may be absolutely necessary.

Wage Conditions in N. M.

The following figures are supplied by the state mine inspector of New Mexico, Rees H. Beddow:

COAL THICKNESS, CONTRACT RATES, DAY AND MONTHLY WAGES AND DEDUCTIONS IN NEW MEXICO MINES

Number of corporation...	1	2	3	4	5	6
Thickness of coal bed, ft...	3-9	4-12	4-5	4-7	6	2-4
Contracts						
Mine run per short ton	0.55	0.55	0.55	0.63	0.63	0.75
Entry per yard	1.75	1.75	1.75	2.00	1.50	4.00
Cross cut per yard	1.00	1.50	1.75	1.50	1.50	1.50
Main slope per yard	1.75	1.75	1.75	2.00	1.50	4.00
Turning rooms	3.00	3.00	3.00	4.00	....	8.00
Setting 8-ft. timbers	0.50-1.00	....	0.50	0.80	....	1.00
Per Diem Wages						
Fire bosses	4.00	4.00	3.35	3.75	....	3.50
Shot firers	3.50	....	3.25	3.56	3.20	2.50
Tracklayers	3.25	3.10	3.25	3.20	3.20	3.15
Company-men	3.00	3.10	3.10	3.20	3.20	3.15
Timbermen	3.25	3.10	3.25	3.25	3.20	3.15
Company-men's helpers	2.75	....	2.50	3.20	....	....
Mule drivers	3.10	3.10	3.10	3.20	3.20	....
Car couplers	2.10	....	2.00	2.00	....	....
Rope riders	....	....	....	3.35	....	3.15
Door boys	1.25	1.30	....	1.50	....	....
Electricians	4.00	....	....	....	....	....
Boilermen	3.00	....	....	....	....	2.10
Engineers	....	....	....	....	....	3.15
Weighmen	3.15	....	....	3.20	3.20	3.00
Linemen	2.75	2.50	....	3.25	....	....
Motormen	3.10	3.10	3.25	....	....	....
Tippelmen	Various	2.05	2.25	2.50	2.50	1.50
Blacksmiths	3.75-4.00	....	....	....	....	....
Blacksmith helpers	2.25-2.50	3.75	3.75	3.75	3.25	....
Machine coal cutters	4.00	2.50	2.50	2.65	2.50	1.75
Machine helpers	3.00	4.00	3.50	4.00	3.50	3.25
Monthly wages						
Mine foremen	135.00	120.00	135.00	130.00	120.00	140.00
Stable bosses	75.00-95.00	....	....	....	....	....
Electricians	....	80.00	85.00	80.00	80.00	110.00
Engineers	100.00	125.00	125.00	150.00	....	140.00
Boilermen	....	85.00	90.00	125.00	....	....
Weighmen	....	75.00	....	....	....	....
Prices of Supplies						
Powder, per keg	....	....	....	2.50	2.50	2.50
Permissibles, per lb.	0.20	0.20	0.18	....	....	0.20
Miners' oil, per gal.	....	0.80	0.65	0.60	0.80	0.80
Deductions per Month						
Hospital	1.00-1.50	....	....	....	....	....
Doctor	....	1.00	....	....	....	1.00
Blacksmithing	1.00	0.50	0.50	0.50	1.00	0.50
House Rent						
Two rooms	4.00	4.00	4.00	4.00	5.00	4.00
Three rooms	6.00	6.00	6.00	6.00	6.00	6.00
Four rooms	8.00	8.00	8.00	8.00	10.00	8.00
Average, per room, per month	2.00	2.00	2.00	2.00	2.33	2.00

In this table 1 = Stag Canon Fuel Co., Dawson, N. M.; 2 = St. Louis, Rocky Mountain & Pacific Co., Raton, N. M.; 3 = New Mexico & Colorado Coal & Mining Co., Raton, N. M.; 4 = Victor-American Fuel Co., Gibson, N. M.; 5 = Diamond Coal Co., Allison, N. M.; 6 = Albuquerque & Cerillos Coal Co., Madrid, N. M.

Stoppings should be made of incombustible material and so constructed that there will be no leakage of air through them. Recently some investigations have been made as to the amount of leakage through stoppings, and the results obtained have been quite surprising. The amount of air lost through brattices as ordinarily constructed is very considerable. The efficiency of stoppings of various materials is a subject worthy of investigation by all large mining companies.

The Labor War in Colorado

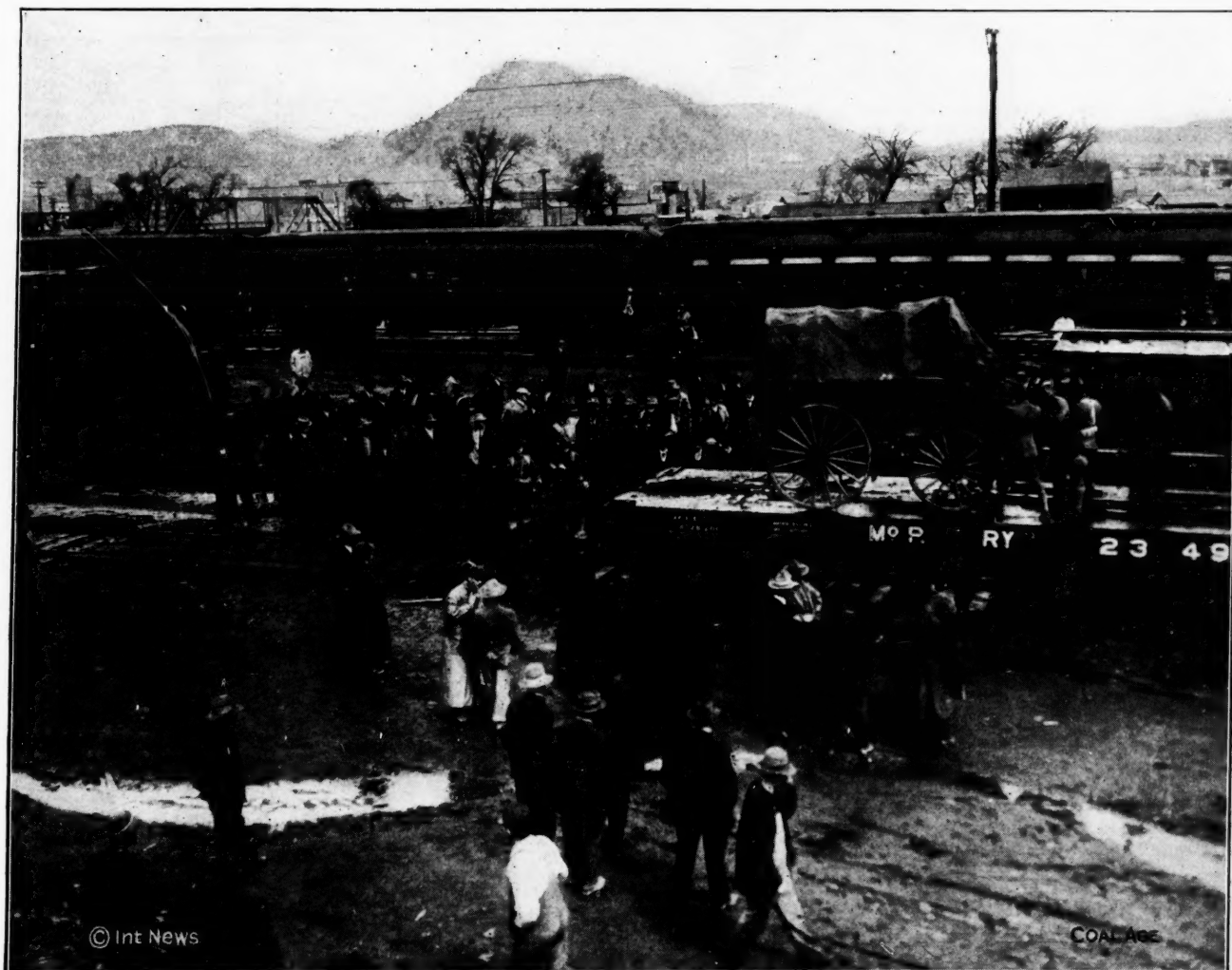
By A. J. Hoskin*

SYNOPSIS—*A regularly paid militia with proper support would have made peace in Colorado without bloodshed. But the sense that the militia was without the necessary backing emboldened the malcontents to acts of violence.*

The general public is aware that a distressing condition exists in the Colorado coal-mining districts. There is no

AMMONS IMPARTIAL

There can be no doubt that Ammons has endeavored to remain absolutely impartial in handling this situation. Indeed, his refusal to take sides brought upon him criticism first from one side and then from the other—criticisms that were quite unfair. Perhaps the statement that he has been weak-kneed possesses an element of fact but he should be given credit for trying to be square. This freedom from bias on his part is substantiated by the fact that, up to date (May 11), neither faction has been ready to make any specific



U. S. REGULARS DETRAINING FOR SERVICE AT LUDLOW, COLO.

question regarding the seriousness of this state of affairs, and to set the entire matter before the readers of "Coal Age," the following explanations are presented.

In the Mar. 7, 1914, issue appeared an account of the early portion of the investigation then being conducted by congressional authority. During the stay of the congressional committee in the state, warfare in the camps was but temporarily suspended for everybody who was sufficiently familiar with the long-standing trouble to formulate opinions was convinced that the trouble was but smoldering and that the withdrawal of the congressmen would be a signal for renewed deadly activities. Governor Ammons, one citizen who held this belief, expressed it to a few friends at that time, adding that he wished the committee could remain in Colorado permanently.

*Mining engineer, 308 Commonwealth Building, Denver, Colo.

charge against him, although both unionists and operators have suggested his impeachment.

MILITIA UNPAID

Governor Ammons was seriously handicapped from the start by the fact that the treasurer of the state, Roady Kenahan, is a union member and sympathizer. The sending of the militia into the troubled zone was absolutely warranted, and unprejudiced persons are unanimous in believing that, with proper appreciation for their services, these men would have been able to reestablish peace in a short time. But remuneration for their distasteful and extremely hazardous duties was effectually blocked through the refusal of Kenahan to pay, or to devise ways for paying, the military bills.

Just as soon as the officers of the union found themselves protected at the state house and were assured that the congressmen were out of the state, they were emboldened to renew their offensive tactics on a stronger scale than ever.

Because Ammons strove to compel Kenahan to pay the expenses of the national guard, he was denounced by the union officials and by all the strikers.

HOW LAW AND ORDER WAS DEFIED

Guerilla warfare increased daily until it finally mounted to pitched battles. Ridicule of the militia was expressed by all unionists who were openly pronounced in their efforts to exterminate these men. The soldiers were obliged to protect themselves, and their duties were thus made manifold, viz., to protect lives of all citizens; to protect property against incendiarism and other forms of destruction; and to preserve their own lives. It was no wonder that these men who went into this campaign unprejudiced and from all walks of life should acquire hatred for these willful enemies of law and order.

The breach continued to widen. Murder, arson and theft were probably perpetrated by representatives of both the union and the militia. This chaos culminated in an all-day battle that destroyed a tent colony at Ludlow. In this conflict, the strikers suffered heavily. Frail tent houses that had been erected to house families of striking miners were destroyed by fire and, of course, the soldiers were accused of willfully starting the conflagration. After the battle ceased, the bodies of 3 women and 11 children were found in a cellar or cave that had been excavated beneath one of the main tents, and the report was spread broadcast that the soldiers had wantonly murdered them.

UNION HAS ACTIVE PRESS AGENT

The secretary-treasurer of the United Mine Workers of America for this district, E. L. Doyle, wired lurid, misleading statements and accusations to all unions in the state and to editors of the press generally. In his telegram to the press he said "a score or more women and children probably murdered in the most terrible massacre in American industrial history. Women and babes forced to lie in ditches and cellars 24 hours without food or water. Murderous guards keep up attack on men, and all may be slaughtered." He wired the unions: "Tell the miners of your communities to defend themselves at any cost."

It seems probable, as reliable witnesses, who were on the ground, have said, that the women and children died in the pit through suffocation; that they had been placed there by their own men; and that the house-tents were not fired, at least, at first, by the soldiers who were a considerable distance away, but through the accidental overturning of stoves. Positively no wounds could be found upon the bodies of these victims. Moreover, officers of the militia are pronounced in declaring that the soldiers did not know that women and children were imprisoned until their bodies were found in the ruins.

A few days later, during another battle, a uniformed Red Cross surgeon, while attending a wounded militiaman, was shot dead by strikers.

THE UNITED STATES ARMY IS CALLED TO COLORADO

Thus the warfare has continued. There have probably been numerous casualties that did not reach the press. This bitterness between the state troops and the strikers can never be eliminated. The situation finally became such that the general public demanded the presence of Federal troops, and, after a few days of petitioning, President Wilson and Secretary Garrison complied with the almost universal request. Troops were slow in arriving, however, and many atrocities were committed. It seemed that as much damage as possible should be done before the government soldiers arrived.

The coming of the United States army was hailed with satisfaction by not only the public, but by the striking element, and it was hoped that peace could be quickly established. As fast as regulars reached a coal-mining district, the state troops evacuated or relinquished authority. But even yet, there are several unprotected camps. Leading men of the union have, in instances, met the Federal troops and greeted them cordially, professing perfect faith in them. How much of this was really sincere remains to be seen, but already there have been numerous acts committed by the unionists that upset the hopes of Colorado's noncombatant citizens.

During the occupation of the camps by the Federals, Chairman Foster, of the Congressional Investigation Committee, endeavored to induce John D. Rockefeller, Jr., one of the heavy holders of stock in the Colorado Fuel & Iron Co., to arbitrate with the union. It is not necessary to repeat here the telegraphic correspondence for it was published in these columns, but it will be well, perhaps, to recall some of it. Mr. Rockefeller wired back to Mr. Foster that the proposal had been forwarded to the officers of the company in Colorado.

TEN THOUSAND MEN WORKING

Upon receipt of the proposal, the principal operators in the state convened, Apr. 29, and sent to Mr. Foster a long telegram reciting events about as given herein but going into detail regarding the destruction by strikers of various mining plants throughout the state. The operators then claimed to be working 10,000 contented nonunion miners to whom they had pledged protection, and whom they declined to discharge from service at the behest of any organization. The telegram said: "We cannot enter into negotiations of any character with the officers and agents of the United Mine Workers of America who alone are responsible for the terrible reign of disorder and bloodshed." This document was signed by 20 leading operators in the state, including the Colorado Fuel & Iron Co.

On May 3, while serious demonstrations against Mr. Rockefeller were being enacted in New York, the same operators with the exception of the Colorado Fuel & Iron Co., held a conference and sent a remarkable telegram to President Wilson, deploring the attacks upon Mr. Rockefeller and denying that they, the operators, should be overlooked in the placing of responsibility. They announced their refusal to have any dealings with the "organization purporting to be a labor union calling itself the United Mine Workers of America."

LAWS ARE EXTREMELY DRASTIC

The telegram, which was lengthy, went on to say that the coal-mining code of Colorado is very strict, that it was approved by John Lawson, and it has been and is being enforced by James Dalrymple, a state coal-mine inspector and a member of a labor organization. It further charged that the leaders of the United Mine Workers of America, "by their criminal acts, have foreclosed any right it may ever have possessed to demand of us that we have business relations."

A proclamation from President Wilson is daily expected ordering the dispersal of all mine guards and strikers. The surrender of firearms to the Federal soldiers, in compliance with orders from Secretary of War Garrison, has not been as prompt on the part of the strikers as the war department had expected, and one union official is quoted as having said yesterday that his men's confidence in the troops had been betrayed. If this be true, it forebodes continued trouble and the Federal soldiers may witness the expression of an animosity such as was shown toward the state troops; though, of course, there will be less uneasiness as to the outcome. It is doubtful if the strike leaders are now able to control their followers in this matter of disarmament.

At this writing, operators and unions are standing pat and the situation threatens to be decidedly worse before it improves. The disinterested citizen can see no immediate settlement unless it comes about in some way as yet unsuspected.

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Electric Lamps for the Prevention of Mine Accidents

By FRANCIS A. POCOCK*

The recent explosion at Eccles, W. Va., where 180 men lost their lives, should stir up the whole world to determine what method will eliminate such casualties.

The coroner's jury in its verdict, in part, found:

The accumulation of gas in Mine No. 5, which was the primary cause of the explosion, was due to a short circuit of the air in the southern section of the mine. This gas was ignited by an open lamp and the explosion followed.

In this twentieth century of progress and development, there is no good reason for the existence of open-flame lamps in the mines. These lamps are tolerated simply for lack of something better. Now that that something is on the market, in the form of the electric safety lamp, which decreases mine fatalities and makes chances of fire remote, why then does the operator still take that chance?

ADVOCATES USE OF ELECTRIC LAMPS EVERYWHERE

In every mine, there is room for a practical electric lamp that is clean, convenient, economical and safe under

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all conditions. The electric mine lamp of today, in its latest improved form, is gradually being and must surely become universally recognized as the most practical, most efficient, and by far the safest of all existing mine lamps of any class.

It is an indisputable fact that in every mine there is a light problem. Whether the workings produce anthracite or bituminous coal, whether they are gaseous or nongaseous, whether they constitute a small or a large operation; the fact remains that the miners must be absolutely dependent upon artificial light in the execution of their work.

The electric lamp is the only light which really assures safety, and if all workers were equipped with electric lamps, and the so called flame safety lamps were placed in the hands of experienced men only, for the sole purpose of testing for gas, accidents in the mines would be reduced to a minimum. The electric lamp is one of the best devices ever invented as a preventive of mine accidents.

The U. S. Bureau of Mines has approved several electric lamps as permissible for use in gaseous mines, and that electric lamps are practical is proved by the number now used by coal operators throughout the country and by

the many repeat orders these operators are placing for such lamps.

Aside from the importance of safety, everybody knows how uncomfortable and annoying to the miner is the foul-smelling, smoking oil torch, the fumes of which are detrimental to his health and decrease the efficiency of his work.

Mixed lights in gaseous mines are dangerous, and the use of safety lamps should be required by law in all such mines. Men will be careless, so why should operators take the risk of using both safe and unsafe lights in the same mine? Moreover, many powder explosions will be avoided by dispensing with open-flame lamps.

Coming Meetings

The summer meeting of the **West Virginia Coal Mining Institute** will be held in Cumberland, Md., June 2, 3 and 4.

The annual meeting of the **Mine Inspectors' Institute of the U. S. A.** will be held in Pittsburgh, Penn., June 9, 10, 11 and 12, with headquarters at the Seventh Avenue Hotel.

The annual meeting of the **International Railway Fuel Association** will be held in Chicago, Ill., June 18, 19, 20 and 21, with headquarters at the Hotel La Salle, La Salle and Madison Sts.



TELLING HIS FORTUNE

Effect of Panama Canal on World's Coal Markets

BY F. R. WADLEIGH*

SYNOPSIS—A careful analysis of *Ex-Governor Mac-Corkle's* interesting paper on this subject. As probably one of the best informed men in the country on our export trade, Mr. Wadleigh's frequent exceptions to statements in the original paper, are of particular interest. The second installment of the article will appear in an early issue.

I beg leave to offer a few criticisms of an article in *COAL AGE*, beginning Feb. 14, entitled, "The Relation of West Virginia Coal to the Panama Canal." A paper of this kind to be valuable should be accurate as to facts, its deductions carefully made or it is of doubtful value.

This article begins with the following statements:

The Suez and Panama Canal routes, respectively, control the great international trade lines of the world. Which of the rival routes will receive the bulk of the traffic will not be decided solely by the relative distances of travel, which, using one or the other will entail. After a somewhat careful investigation of these great trade routes, it seems that the shipowner will use one route or the other, actuated not only by mere distance but also by the price and quality of the fuel he can purchase along the line.

The first statement is one of those general and inaccurate statements so often made in selling arguments. The Suez Canal is now a controlling factor in one of the great international trade lines; it does not "control" anything. There is as yet no Panama Canal route. When the canal is completed, its effect on the great trade lines will still be an unsolved problem.

The shipowner or charterer will undoubtedly use one route or the other, but there are factors to be considered besides those of the distance and the quality and price of fuel. One such factor and a most important one is the number of available markets *en route*, from point of origin to destination. On the Suez Canal route there are numerous markets which would give employment to steamers and abundant freights, while the Panama route from Europe will be a long sea voyage with no available markets for trading.

Another factor to be considered is the number and distances between coaling stations, an important item when freights are high. The article under discussion makes the following erroneous statement in this connection:

If the route through the Panama Canal becomes that most generally used by the ocean-going ships of the world, the isthmus will in itself become **the greatest coal-distributing point** upon which the sun shines, and this fact will make the fuel of West Virginia one of the preponderating influences in the world of trade.

It is obvious that the Panama Canal route cannot be that most generally used by the ocean-going ships of the world, but only by those trading in certain ports and between the Atlantic and Pacific, and therefore cannot become the greatest coal distributing point, etc.

THE PANAMA VS. THE SUEZ ROUTE

The fuel of West Virginia, good as some of it is (not by any means all), can never be more than a detail in the world's trade. The only West Virginia coals that can

be used at Panama are the New River-Pocahontas, and their production is limited while their quality is not altogether uniform. Out of the 148 billion tons of West Virginia coal remaining unmined (as stated in the article under discussion), by far the greater portion is not suitable or available for the export trade, unless for special purposes.

Still another factor that must be taken into consideration on the use of the Panama route, will be the attitude of the underwriters. Will they stiffen rates on ships naming the Panama route, on account of the possible dangers from slides and earthquakes? Upon their decision on these matters the commercial aspects of the Panama Canal will and must largely depend. So far no collective action has been taken or decision arrived at, but the question must come up soon and is likely to be a deciding factor in the commercial success of the canal.

It is, of course, true that many, in fact most of the Far East ports, Australia and Asia, are nearer Europe by the Suez Canal than they will be by the Panama. The distances to various Pacific ports, as given in the article under discussion, are not altogether accurate, according to the latest English distance tables (Philips, 1913).

The article gives the following distance data (not tabulated):

	Distance, Miles	In Favor of	Miles
Liverpool to Adelaide via Suez...	11,142	Suez	2336
Liverpool to Adelaide via Panama	13,478		
Liverpool to Manila via Suez...	9,701	Suez	4421
Liverpool to Manila via Panama.	14,122		
Liverpool to Hong Kong via Suez	9,785	Suez	4172
Liverpool to Hong Kong via Panama	13,957		
Liverpool to Yokohama via Suez.	11,678	Suez	694
Liverpool to Yokohama via Panama	12,372		
Liverpool to Wellington via Suez.	.....	
New York to Wellington via Panama	.....	Panama	4138

Distances between same ports, according to Philips' tables, are as follows:

	Distance, Nautical Miles	In Favor of	Miles
Liverpool to Adelaide via Suez...	10,710		
Liverpool to Adelaide via Panama	13,440	Suez	2730
New York to Adelaide via Panama	10,882	New York	172
Liverpool to Manila via Suez....	9,554		
Liverpool to Manila via Panama.	13,973	Suez	4419
New York to Manila via Panama.	11,415	Liverpool	1861
Liverpool to Hong Kong via Suez	9,651		
Liverpool to Hong Kong via Panama	13,904	Suez	4253
New York to Hong Kong via Panama	11,346	Liverpool	1695
Liverpool to Yokohama via Suez.	11,113		
Liverpool to Yokohama via Panama	12,282	Suez	1169
New York to Yokohama via Panama	9,724	New York	1389
Liverpool to Wellington, N. Z.	11,981		
New York to Wellington via Panama	8,510	New York	3471

The article then says:

The use of the Panama Canal will give New York 4138 miles advantage over Liverpool on the journey to Wellington, New Zealand, and the distances will be about equalized, relatively speaking, on the journey from New York and Liverpool to the countries I have mentioned.

As a matter of fact, New York will have only 3471 miles advantage over Liverpool to Wellington, not 4138. Distances on trips from New York and Liverpool to

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points mentioned above will not be equalized by use of Panama Canal, as is shown by the second table.

Again it is stated in the article that:

The canal should allow this country largely to dominate by distance the coast of South and Central America.

As far as coal is concerned, the Panama Canal should enable us to dominate the coal trade of the *west* coast of South and Central America.

The article then states further that one advantage is possessed by the Suez Canal, namely, that coaling stations are located along the great English trade routes (why English alone?) and that if this country proposes to take any part of the "steaming demand" (meaning, it is presumed, the supplying of coals for ship bunkers) it must provide ample coaling stations for international commerce.

THE TRANSPORTATION PROBLEM AND THE SOUTH AMERICAN MARKETS

This is true, of course, but the building of large coaling stations at Panama alone is only partly filling this need. We should have a coaling station at the Azores, another in the West Indies (where there are now several private ones, carrying West Virginia coals in stock), and one at San Francisco, or otherwise the West Virginia product may be restricted to the Panama Canal stations or be dependent on private enterprise and strong competition.

There are, however, two possibilities that would alter entirely the conclusions arrived at by Mr. MacCorkle and which he seems not to know about or to have lost sight of.

First—If the statements of Government officials are true, it is the intention of the Government to build 12,000- to 15,000-ton colliers to carry coal to the Isthmus; it is estimated that coals can be carried by these colliers at about 90c. per ton.

Second—The building of 15,000-ton cargo ships for carrying iron ore between Chile and New York, for the Bethlehem Steel Co. may enable private shippers to compete with the Government-built colliers in carrying coal to Panama. These ships, to be operated under the Norwegian flag, as is said, will be able to carry coal as a return cargo very cheaply.

The United States has the coal, but cannot build ships in competition with England or Norway and Italy, nor can she operate them at less than 50% higher cost under the United States flag. What this country, under our present navigation laws, can and must do in order to ship coal into foreign markets, is to build ships abroad and run them under a foreign flag.

As regards coal and freight rates to the South American coasts, the coal used in the West Coast is British and Australian, because of the certainty of return cargoes, which tends to make low rates, but the British ships do not "control" the markets by any means; there is also a large tonnage of native coal used in Chile. The British coal owners, however, have other strong and active interests in South America, with which the West Virginia coals must reckon. Stock ownership in railroads and steam plants, organized and aggressive selling agencies, ownership of docks and handling facilities, and (strong factors in South American countries) custom, use, friendship and prejudice.

Take the British exports alone to South America in 1913:

Brazil	1,886,000	Chile	588,000
Argentina	723,000	Peru	60,000
Uruguay	3,693,000	Ecuador	10,000
Total	6,302,000	Total	658,000

As will be noted, by far the largest coal markets in South America are those that will only be indirectly affected by the Panama Canal, Brazil, the Argentine and Uruguay, whose imports of coal are about five times as large as those of the whole west coast.

FUEL-OIL COMPETITION AND THE AMERICAN MARINE

There is also no mention made of the strong competition that may be expected from the large and increasing use of fuel oils at Panama; yet even the U. S. Government is making preparations to meet the demand for oil as fuel. There is already a pipe line across the Isthmus and large storage tanks. The power plants on the canal work, with the exception of those at or near Colon, are now using oil, or were a short time ago, the Canal Commission having a contract with the Union Oil Co. for California oils.

The use of oil as a steamship fuel is growing rapidly and Panama is within easy reach of several oil fields, California, Texas and Peru, beside the developing fields of Venezuela, Ecuador and Trinidad. While the price of fuel oil is still high, it has decreased since January over 1 cent a gallon, and the West Virginia coals may look for strong and growing competition from its increasing use.

Moreover, if the carrying trade between the west coast of North America and Europe is made larger by the Panama Canal, then cargo-carrying space will become most important and the owners of motor ships using oil will be able to carry produce to Europe at a lower rate than can be made on coal-burning vessels.

Under the caption, "Need for an American Marine," the article says:

If these markets become as important in American commerce as they should be, America must control the ships necessary for her trade. Let me illustrate my argument by showing that length of voyage and cheapness of fuel do not always settle the cost of transportation. The marvelous ability of the Englishman to ship his coal to every part of the world and sail his ship in every sea, despite the competition of the nations, is well exemplified on the coast of South America. At Valparaiso, Iquique, Antofagasta and other points on the Western coast of South America, the coal is largely Welsh and Australian, because of the low freight rates on vessels bound for Chili to secure nitrates. On the eastern coast of South America the same condition exists; British ships control the markets and are able to take coal cheaply to different coasts, as they can obtain the return traffic.

In other words, American coals cannot obtain the markets to which they are entitled, unless American ships are more plentiful upon the seas and American trade is more diversified under new laws and new conditions. Only then may we send our products into every country and among every people.

By American is meant, of course, the United States. The factors that settle transportation costs are: 1. Length of voyage. 2. Cost of running the ship; fuel, wages, stores, machinery, interest and depreciation.

But the freight rates are governed by: Demand and supply, market and return cargoes, in addition to the actual costs, plus what profit the traffic will stand.

The ability of the Englishman to ship his coal to every port of the world is due to two facts: He has the coal, owns the ships and can operate them cheaply.

COST OF COAL AT PANAMA

The article states that the prices paid for coal by the Government have been fixed for two and a half years. This period began Apr. 1, 1912, and on the new contract, which is nearly due, it is very doubtful if the present price of \$2.70, f.o.b. Hampton Roads, will be renewed, because of the higher level now prevailing.

Bids opened recently for supplying coal to the Navy were on a basis of \$2.90, f.o.b. Hampton Roads. The ocean freight transportation to Panama is also likely to vary, as it has in the past; it is now \$1.39½ and not \$1.29½, as stated by Mr. MacCorkle. The following are the ocean freight rates paid in the last nine years:

1905.....	\$1.44½	1910.....	\$1.34½
1906.....	1.65	1911.....	1.29½
1907.....	1.52	1912.....	1.39½
1908.....	1.49	1913.....	1.39½
1909.....	1.40	1914 to Oct. 1.....	1.39½

This would make the present cost of coal, c.i.f. Panama, \$4.09½, to which must be added, handling, interest, depreciation and profit, easily \$1.50 more, or a total of \$5.59½.

The present prices for coal at the Isthmus, as sold by the Panama R.R., are:

Colon	\$5.75 alongside to U. S. Navy
	5.27 @ 7.62 on railroad cars
Panama	8.62 on lighters alongside
	\$10.12 on lighter alongside.

Under this caption: "Welsh Coal at Port Said," the article states: "In 1912 the contract price for Welsh coal at Port Said was \$6.33 per ton." This was not the price of Welsh coal, but of Durham unscreened bunkers, and today this is being quoted at \$6.95, f.o.b., which is \$2.04 above c.i.f. cost.

WHAT "WELSH" COAL IS

The term "Welsh" coal is loosely used throughout this article and in many other similar discussions on British coals. In South Wales, alone there are 22 seams of workable thickness and the coal varies considerably, the steam fuels alone ranging from 11 to 29 per cent. volatile, so that to speak of Welsh coals lumped together and as of the same character, is about as inaccurate as to refer to the Pennsylvania fuels in the same way.

Moreover, the Durham unscreened bunker coal is largely supplanting Welsh bunker fuels for use at foreign steamship coaling stations. At the Canary Islands, for instance, in 1913, out of the 827,000 tons supplied steamships at Las Palmas, 427,000 tons were Welsh and 257,000 Durham coals, while at Algiers, 48 per cent. of the coal used was also Durham.

A typical analysis of this coal from an actual shipment is as follows:

Moisture	1.50	Ash	6.10
Volatile	30.13	Sulphur	0.92
Fixed carbon.....	62.27	B.t.u.	14,413

The present price for this coal, f.o.b. River Tyne ports, is \$3.16.

The attitude of the British coal shippers is indicated by the following extract from an editorial in the *Iron and Coal Trades Review* (London).

Possible Changes in Trade

Beyond the bunkering business it is difficult to see how the opening of the Panama Canal will benefit the American or injure the British coal trade to any great extent. It will not alter our position with regard to the Atlantic States, to which the great bulk of our South American coal exports is shipped. The Pacific Coast of South America will certainly be more vulnerable to American attack, but our exports to those markets are not very large, and, moreover, British firms have secured an excellent footing there; on the confession of the accredited consular representatives of the United States in

the countries in question, it will be difficult to shake our hold on these markets.

It is easy, therefore, to exaggerate the consequences of the opening of the Panama Canal so far as our coal trade is concerned, and we feel sure that British exporters having connections with markets likely to be affected at all are fully alive to possible dangers and are taking steps accordingly. In his paper on the Panama Canal, read before the British Association, Professor Kirkaldy seemed to suggest that it might enable the United States to displace British coal throughout the world, and he urged both the capital and labor interested to forget internal causes of difference and to unite against the common enemy.

This certainly appears to be an entirely alarmist view of the situation. For some years past now our American friends have been paying more attention to their coal-shipping trade, which, while still small as compared with our own, has increased rapidly of late. It is certain that they are not likely to miss any fresh opportunities which the opening of the canal may afford them, but why this impending event, important as it is, should deliver a mortal blow to the British coal-shipping trade, we cannot conceive. It is better to be warned, however, even in exaggerated terms, than to remain over-confident when a wealthy and enterprising rival is in the field and it will be well to keep an eye upon the activities of our American competitors.

(To be Continued June 13)

Coal Mining Active in New Mexico

The production of coal in New Mexico in 1913 was 3,708,806 short tons, with a value at the mines of \$5,401,260, according to E. W. Parker, of the United States Geological Survey, who compiled the figures in coöperation with the State Geological Survey.

In 1913, as in 1912, New Mexico outstripped all previous records in the production of coal. The output in 1912 was 3,536,824 short tons, valued at \$5,036,824, compared with which that of 1913 showed an increase of 171,982 tons in quantity and of \$364,209 in value. The average price per ton in 1913 was \$1.33. Colfax County in 1913 produced 2,749,765 short tons.

The number of men employed in the coal mines of New Mexico increased from 3928 in 1912 to 4329 in 1913. The average production per man decreased from 900 tons in 1912 to 857 tons in 1913. This decrease was not due to any falling off in efficiency, but was one of the minor effects of an appalling disaster which occurred at Mine No. 2 of the Stag Cañon Fuel Co., at Dawson, in October, 1913. This accident, one of the most disastrous of the year in coal mining and the worst in the history of the state, caused the death of 261 persons. It occurred in one of the mines of a company which had spared no expense and had taken every precaution human intelligence could suggest to reduce the hazard of coal-mining operations. The other fatalities reported to the United States Bureau of Mines outside of the explosion at Dawson were 11, making a total of 272.

BY THE WAY

A sack is best tied before it is full.

Religion is the best armor, but the worst cloak.

It is not enough to run; one must start in time.

The rock that resists a crow-bar gives way to the roots of a tender plant.

He that will not sail until he has a full, fair wind, will lose many a voyage.

The Colorado Strike

SYNOPSIS—The strike is largely over in Colorado, but is in strong evidence still in Washington and New York, where a determined effort is being made to create sentiment adverse to the operators, so that the troops will be ordered to close the mines. Lieut. K. E. Linderfelt denies that he struck Tikas, and charges the residents of the armed camp at Ludlow with many crimes.

The settlement in Colorado does not rapidly approach a conclusion. The mines are working, but the men, who are seeking to replace the present workers, are still undispersed, and trouble may at any time arise if their belligerent attitude to the employees of the coal companies is not kept in check by a strong hand, and rumors are even afloat that the strikers have received and buried some machine guns.

The bill in the legislature providing for a bond issue was finally passed. Some of the legislators desired that there should be incorporated in it a provision requiring that no payment should be made to those who were subjected to the attack of the strikers at Ludlow or were at any time employed by the companies as mine guards. It appears, however, that in the end the legislature took the position that even granting unlawful acts were committed by the militia in repulsing the attack of the strikers, the pay for lawful service could not be refused and that the state could not repudiate its obligations to any militiaman who was engaged by the properly constituted authorities. Nor is the legislature a court of law to decide either the guilt of the militiaman or the authority of its agents, especially without a hearing.

Any other conclusion would be a folly of which many of the present legislature would doubtless be capable, but if the proviso were added to the bill, it would inevitably make it hard for the state in the future to engage the services of a militia. In fact, it is likely that when that body is next called for service, none may respond, for the men who would serve are heartily sickened not of military service but of unmilitary partisan criticism and condemnation.

THE ANXIETY OF THE PRESIDENT

As has been already stated, the bill providing the \$1,000,000 bond issue to pay the militia for past and future services was finally enacted.

It seemed doubtful whether Governor Ammons would be able to secure its passage and the President wrote to him urging the necessity for such provision as the troops could not be kept for a lengthy period at the scene of war. Governor Ammons assured the President that acts had been passed for closing saloons, prohibiting the carrying and transporting of arms, providing for a committee on mediation and authorizing the million-dollar bond issue. The United Mine Workers expect to contest the validity of this last provision.

The President's insistence aroused considerable excitement. The Women's Peace Association, through Mrs. Alma Lafferty, and also E. Keating, the Congressman-at-large made vehement protests against a return of the militia, causing Secretary of War Garrison to declare that there was no intention to withdraw the troops. Governor Ammons is said to have made the stupid promise not to send out the militia until its presence might seem imperative even if the federal troops should be withdrawn.

THE LUDLOW CAMP

The Secretary of War is permitting the reestablishment of the Ludlow tent colony, and a detail of men have been preparing the site and removing rubbish. A ban has been placed forbidding any man to move into the colony who was not employed at one of the neighboring camps prior to the beginning of the strike. The military will check this information by means of the operators' pay-rolls, and it is hoped by this move to keep out sojourners and a large percentage of the rough element, who had no right to be in the colony and who were responsible, in a large measure, for much of the trouble which occurring, ultimately caused the destruction of the camp.

The position of the administration is difficult. The property rights of the United Mine Workers of America cannot be denied, and the colony, though used as a hostile camp, is not on its face a menace to public order and, therefore, not subject to seizure like a gun. Only one member of the Mil-

tary Commission, the major and judge advocate of the military district, urged in his report of the Ludlow battle that the colony should not be rebuilt.

There were doubtless many men and women in Ludlow of reasonably peaceful disposition who were much incensed at the leaders who brought war upon them by firing on the militia and retreating on the camp. It was significant that these men who thus drew the fight into the heart of the camp turned a deaf ear to the women and children when the tents began to burn and consume the noncombatants.

A fund of \$25,000 is said to have been raised for the rehabilitation of the Ludlow camp. The new colony will be built in almost the same location as the old.

JUDGE LINDSEY

Judge Ben B. Lindsey, of Children's Court fame, visited the President, May 21, accompanied by Mrs. Lee Champion, chairman of the relief committee, which investigated the conditions in the strike district for 20 days. Mrs. Adolph Germer, wife of a strike leader, Mrs. Petrucci, Mrs. M. H. Thomas and Mrs. Pearl Jolly, the three latter being widows of men killed in their attacks on the militia. Mr. Lindsey endeavored to have the President close the mines till the settlement between the idle miners and the companies was completed. Apparently he has not succeeded in modifying the President's decision.

Judge Lindsey's trip has been condemned both by the Real Estate Exchange and the Chamber of Commerce, both of Denver. The Colorado Woman's Law and Order League has sent its vice-president, Mrs. Helen M. Grenfell, to urge the President not to accept Judge Lindsey's views of the situation. She strongly defends the action of the militia. On the other hand, the Woman's Peace Association is sending a representative to offset the action of the Law and Order League.

Mrs. M. H. Thomas and Mrs. Jolly have delivered their story before several organizations in New York City, and the former, after declaring that she loaded the guns of the Ludlow disturbers of the peace, added that she did not know why she was arrested.

LINDERFELT'S TESTIMONY

Lieut. K. E. Linderfelt in his testimony in the trial of Major P. J. Hamrock stated that he did not strike Louis Tikas and could find no evidence of Tikas' head having been smashed in. He said he did not tell his men to shoot Tikas, Rubino and Fyler if they tried to escape, but he assumed they knew their duties under military law. He denied that any tents were fired deliberately and stated that "spread" bullets and those with "percussion caps" were found among the ammunition of the strikers. He said such bullets would "cut a man in two" and were manufactured for killing "elephants, tigers and big game." He declares that two men in a buggy carrying a white flag fired on the militia as they passed. He repeated his story about the rescue of the women and children.

The trial of Major Hamrock closed May 20, the accused himself being the last witness. There are 30 others to be tried. The report will be forwarded to Gen. John Chase and later to Governor Ammons. Linderfelt's trial commenced on the 20th inst.

UNION RECOGNITION NOT WAIVED

The prospect of arbitration has received a body blow from William Green, of the United Mine Workers. He stated to the union miners of Illinois at Peoria, that he was misrepresented as having said that the organization was prepared to arbitrate even if the recognition of the union was waived. He agreed with the Illinois miners that this recognition was the purpose of the strike and could not be compromised.

So the statement of Martin D. Foster to John D. Rockefeller, Jr., that it was possible to arrange such arbitration was premature, based as it was on the alleged statement of William Green only and he denies that he made any such declaration.

DECIDING WITHOUT HEARING

Attempts toward conciliation are being made by a general committee from every county in Colorado to meet June 6 in Denver. The legislative investigating committee is also trying to make progress and has been promised the co-operation of the operators. It is seeking to settle the strike without investigation, a very frank procedure to be commended to other would-be arbitrators. If you are seeking only to divide hostile claims in half, why waste time by find-

ing out whether the claims are just. The members of the "Investigating" committee refuse to state whether the operators are willing to arbitrate. It is understood, however, that they are only desirous of supplying them with the facts.

DISSATISFIED WITH FEDERAL INTERVENTION

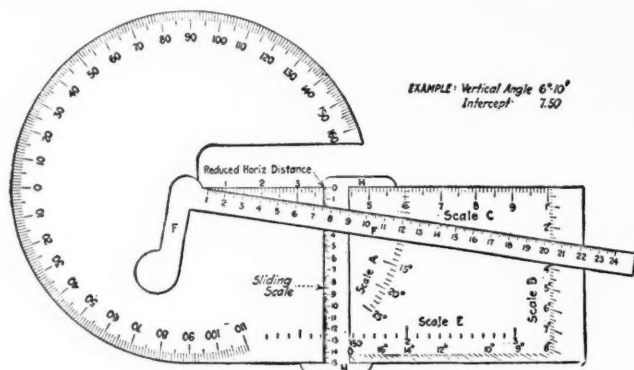
There are not a few signs that the action of the Army is losing popularity among the union officials. Speaking at Beethoven Hall, New York City, May 25, James Lord, the representative of the United Mine Workers of America in the American Federation of Labor said, according to the "New York Times:"

"We prayed to President Wilson for months in vain before he finally sent the troops. He dispatched them only when at last we were in a position to fight back. We do not know why he sent the troops, but if it was to drive us back to the old slavery, he won't be able to do it. If he tries or if he surrenders us to the militia, then it stands to reason that we will not again try to fight the hired gunmen of John D. Rockefeller. Instead we will go after the Rockefellers themselves."

A Rapid Stadia Plotting Apparatus

In the development of large tracts of land the preliminary work must be a good topographical map having all details and contour lines. For the preparation of such maps there is no method so rapid and convenient as the stadia survey by which the distance and elevation of any point can be ascertained by the reading of a vertical angle, and the space included between the horizontal wires of the instrument as seen projected on a level rod.

There has hitherto been delay in getting the desired results on the map, since the horizontal and vertical distances had to be obtained by calculation. The Averill



STADIAGRAPH INVENTED BY C. K. AVERILL FOR PLOTTING STADIA NOTES

stadiagraph overcomes this inconvenience and makes it possible to plot results as rapidly as the observations can be taken in the field. The instrument consists of a protractor turning on its center, and carrying a straight-edge, also a revolving scale of the map, and a sliding scale showing elevations.

The operation is clearly shown in the illustration printed herewith. Some of the largest coal companies in the country have used this instrument, and their engineers are unanimous in their praise of its ability to accomplish what is claimed for it in reducing the cost and time of map-making in stadia work.

The apparatus is manufactured by C. K. Averill, Bridgeport, Conn.

American Mine Safety Association's Medals

Last year the American Mine Safety Association presented medals at Lexington, Ky., to the Wisconsin Steel Co.'s team, at Benham, Ky., and the Continental Coal Corporation's team of Pineville, Ky.; at Cresson, Penn., to the Pennsylvania Coal & Coke Co.'s team of Patton, Penn., and to the Hastings team of the same corporation; at Somerset, Penn., to the team of the Consolidation Coal Co., of Acosta, Penn.; at Oakford Park, Penn., to the Magee team of the Westmoreland Coal Co.; at Central City, Ky., to the Graham team of the W. G. Duncan Coal Co., and at Knoxville, Tenn., to the Briceville, Tenn., team of the Tennessee Coal Co., to the Westbourne, Tenn. team of the Westbourne Coal Co., and to the Mountain Ash, Ky. team of the Jellico Coal Mining Co., as well as a large number of prizes at its annual field meet in Pittsburgh, Penn.



MEDALS OF AMERICAN MINE SAFETY ASSOCIATION

The presentation of these medals has done a great deal to increase the interest in first-aid and mine-rescue work. There is no better way to increase that interest than by the award of medals by a national authority in the fairness of which all the contestants will have confidence.

The association gives (1) a first prize in bronze at any intercompany contest, (2) first and second prizes in silver and bronze at state-wide contests, and (3) first, second and third prizes in gold, silver and bronze at national contests. But in intercompany contests there must be not less than 5 teams representing 3 separate mining companies; in state-wide contests, 10 teams representative of the various mining districts in a state; and in national contests not less than 15 teams representing as many different mining companies from not less than 5 different states. A medal is given to each of the five members of each winning team.

Prof. W. H. McMillan in a lecture says the difficulties of deep mining can be placed under two heads: Mechanical and physical. The hoisting, owing to the strain on the rope, may have to be done in stages. Ventilation will have to receive serious consideration. Horses will probably have to be dispensed with and mechanical haulage substituted, while electric lamps will take the place of oil lamps. As the miner will be more subject to such diseases as pneumonia, bronchitis and anemia, baths and dress houses at the pit surface will be a necessity.

Editorials

The Purest of Human Pleasures

"God Almighty first planted a garden; and indeed it is the purest of human pleasures. It is the great refreshment to the spirits of man." Thus wrote Francis Bacon, three hundred years ago.

Three hundred years is quite a long time, and yet, in all that time, no one has given us a better description of a garden, nor one that is better calculated to start a man to digging in his own back yard. And so, now that springtime has arrived, we reprint it here, hoping that its message may have the desired effect, and that, forthwith, all our readers will go to gardening.

Many of the larger coal-mining companies have realized the advantage, to their employees, as well as to themselves, to be derived from private gardens and each spring they offer every possible encouragement to all who express any interest in such an undertaking.

In this connection, we have observed many interesting happenings. Superintendents, who, for selfish reasons alone, have offered prizes, to get their men interested in gardens, have unconsciously followed the progress of the gardens so carefully, that they soon were the best informed and most enthusiastic gardeners in their respective camps and, during the following years, have been known to enter the contests, of their own free will.

Pessimists who were "agin" the companies, tooth and toenail and consequently who disapproved the garden scheme, have been known to hanker after the vegetables in their neighbor's gardens later on, and eventually to have removed pickets in division fences and left suspicious trails winding about among the greens.

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Getting in the Spotlight

The Colorado coal strike has afforded Judge Ben B. Lindsey, of Denver, a means to an end. His aim seems to be to secure publicity for Ben Lindsey rather than to obtain a solution of the labor troubles.

His method of approach smacked considerable of the plan pursued by a circus press agent. If he had hoped to be instrumental in aiding a settlement of the Colorado trouble, his interviews along his route of travel eastward were more than sufficient to render ineffective all his subsequent efforts.

One would expect dignity and logic rather than red-fire and an appeal to class prejudice from a man holding an important judicial position such as is filled by Judge Lindsey. However, there is a greater lure to some men in a two-column headline on the front page than there is in maintaining a reputation for unbiased judgment in the face of mistaken public clamor.

Some of us are too prone to forget that other men have wives and children besides those few disaffected individuals who are always ready to lend an ear to foreign persuasion. Not a few Colorado women with babies have gone hungry and suffered because their husbands were prevented from working in satisfied employment by the vio-

lence and threats of a small majority of the miners in Colorado.

Sympathy to be helpful must be fair to all. We are, therefore, not surprised that the Law and Order League of Denver has started a petition for the recall of Judge Lindsey, for a man in his position must himself be a respecter of the law, if he is to administer it fairly.

The fight in Colorado is not a local affair, it is a national issue. The coal industry by chance rather than choice has become the battleground of a great social controversy. The questions are, can an employer exercise his own discretion in the selection or dismissal of his employees, or must he follow the bidding of his men? Must every man working at a trade become a member of the union, whether he wants to or not? In other words, must all industry in the United States be conducted on the closed-shop plan?

President Wilson and his administration are not dealing with the Colorado coal operators and miners alone, they are confronted with a great national labor issue, the solution of which is going to be a matter of vital importance to the conduct of all business in America.

Men like Judge Lindsey do not help things by stirring up class hatred at a time when all appeals should be based on a calm recognition of the absolute necessity of upholding the constitutional rights of both men and property.

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An Application for a New Position

If at all times we only get what we deserve, then a lot of COAL AGE readers will never secure a new job through their written applications.

Three weeks ago the manager of a large coal corporation asked us to suggest a man for the position of mine superintendent, the job to pay \$225 per month. We advised our friend to insert an advertisement in COAL AGE, as being the most likely way to get in touch with competent men. This was done and about 70 replies have already been received, and the inflow is undiminished. We now understand why recently a mine president wrote us saying: "Please stop ad, more than a hundred replies already."

But the interesting fact in the matter to us is the carelessness and lack of judgment exhibited by many of the applicants. Several men wrote brief notes, saying: "Please put me in touch with the parties." Two letters were not even signed, although one of the two was neatly typewritten. About one-third of the applicants failed to state their age or whether they were married; others made no mention of present employment and cited no references.

Now, is it likely when a hundred, or perhaps two hundred applications are before a manager or mine president, he is going to bother writing for further information if none is given in the man's original letter? The chances are he is going to pick out a half dozen, or maybe a dozen

of the most likely men and concentrate on them. His is a game of elimination, and the sooner he can get down to two or three possible candidates for the job, the better he will be pleased.

We have heard so much concerning brevity, conciseness, etc., we are apt to carry the idea to a ridiculous extreme. No one seeking an assistant or other subordinate wants to read all the details of the man's life; but he would like to know a few important facts concerning his age, education, experience, habits and present employment.

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The Need of a Balanced Publicity

The situation in Colorado is of the utmost gravity because it shows on all sides the weakening of the elements of democracy, on which our national life is based. We are beginning to view the masses of the people with a decreased respect and the masses themselves are commencing to take a similar view.

No longer do they realize the importance of *their* part in maintaining the integrity of the national life. The prominent figures of society, the aristocracy if you will, are called upon to change discontent and a struggle into happiness and peace. A war arises in Colorado, obviously fanned by financial help from outside that state, admittedly subsidized by outside influences, and yet there is a call not to the many, but to the important outstanding figure, John D. Rockefeller, Jr. "What will *he* do about it?"

The cry of an enlightened democracy would be rather what *we*, the people, would do to still the artificially created discontent. A real democracy would not acknowledge supermen like Rockefeller from whom to demand a supernal virtue so self-sacrificing as to restore by concessions, a national trouble arising from intrigue.

Let us suppose Rockefeller saying of the strikers of Ludlow: "We will go after them. God being my witness, we will send them back to the hell from which they came." From end to end of the nation that statement would be printed. If the younger J. D. Rockefeller lived 30 years, it would still be quoted by the newspapers to his dishonor, as his body was borne to the grave. The word of shame would never die.

But James Lord, representative of the United Mine Workers of America, in the American Federation of Labor made that statement and can make it unrebuked *about Rockefeller*. No one regards it as deserving of the severest condemnation, for we have lost faith in the democracy. We now no longer expect anything better of it. It is useless any longer to condemn it for its follies, the false balance of its justice or its inhumanity. If anything is wrong, we look for a scapegoat and choose a prominent man, the moat in whose eye is the excuse for the beam in the eye of the people.

It is necessary that the democracy be reestablished, that a renewed sense of personal responsibility be created and indeed it is time that the Rockefellers and others realized that we can no longer, with our large influxes of people, rely on the chances of our national life to illumine those who do not know our language or understand our spirit. There must be a strengthening of our schools, a deepening of our community and religious life and an attempt made to recreate social solidarity.

Political economy must no longer be taught only by the

discontented youth of the country; the press must not depend solely on the pennies of the multitude. But a fairer economy and a nontechnical press which is frankly subsidized, but strictly honest, must be created. It must be confessed that this is a concession to our present undemocratic state, for a democracy should be self-educating, but it is obviously a necessity, if democracy is to be maintained.

Perhaps when the hordes of foreign workmen cease coming, demagogery may be at an end and an era of quiet, constructive effort may take its place. We may yet distinguish clearly between murder and a refusal to arbitrate, so that we will not pass over the recognized felony to visit with maledictions a fault of doubtful character, if fault it really be.

The coal companies may as well take warning now as later and endeavor to create better feeling, and a clearer understanding of the social issues. The democracy has in it the basis of good government, so long as it is not persistently mislead.

Do not let the operator forget that arguments made by him have their effect. Not even the wildest visionaries are wholly confident in the honesty of their leaders, yet they are swayed by their oratory. Similarly, much as the operator's logic may be doubted, there is little question that where it is truthful and honest, it will sink deeply into the minds of its hearers.

Because a few people laugh and sneer at the arguments of the operators and manufacturers, these latter usually resolve to say nothing whatever. But a moment's reflection will show that the diatribes of the socialist and labor leader are similarly treated, but they nevertheless sink home and do their work, sometimes helpful but more often pernicious. So will the arguments of the employers have their effect.

The operators, however, have always been ill-advised and have discussed public questions largely in their own organs and institutes. They must try to reach a wider field and do a broader work among the masses at large. Let them not be afraid to do it. It will not fall on unfruitful ground. The bulk of the American people, like the operators, are fair and may be relied on to give all sides an attentive hearing.

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The time has come when real success means something more than the accumulation of money. Today we are commencing to applaud the man who does most for others, rather than the fellow who has made most for himself. Service rather than dollars is the new measure of manhood. The climate of America is becoming uncongenial for those who have fattened their purse by crushing ambition out of their employees. The big man of the future is to be the one who does most for mankind, not the one who takes most from mankind. Success will be a state of mind, not a state of pocket.

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We have always believed that a little muckraking of corporations does no harm, because in the process we are raising up a high ideal, too high at present for ordinary mortals to reach, too exalted for Congress, but still very meet and right for big business to follow. Make the corporation toe a straight line; in time the "common people" in their private affairs and in their public concerns will try and learn the lessons of which they have been efficient teachers.

Who's Who in Coal Mining

John C. Reid

John Callum Reid is one of the influential personalities in Canadian coal mining. He is not a native of Canada, however, having been born at Sharon, Penn., in 1871.

Mr. Reid was educated as a mining engineer in the Missouri School of Mines at Rolla, Mo., and received the degree of E. M. from that institution in 1893.

His first experience in mining work was secured when he was mining engineer in the coal department of the M., K. & T. R.R. He served this corporation as an engineer from 1895 to 1900, when he was promoted to the position of mine superintendent in Oklahoma by the same concern.

In 1902, Mr. Reid severed his connection with the railroad company to become general superintendent of the

W. L. Moss

W. L. Moss, vice-president and general manager of the Continental Coal Corporation, Pineville, Ky., is a live wire of this progressive Kentucky corporation. He sure is a native of the sod and hasn't wandered very far from home, for he was born in Pineville, in September, 1883. The affection of Mr. Moss for his native state is reciprocated in kind, for he is one of the most popular of the younger men in this wonderful new field.

Mr. Moss received his education at Valparaiso University, graduating in 1902 as a Doctor of Pharmacy. On entering the coal business, he became secretary and general manager of the Straight Creek Coal Mining Co., and remained with this concern until it was consolidated with several other mining companies to form the Continental



JOHN C. REID



W. L. Moss

Great Western Coal & Coke Co. and the Osage Coal & Mining Co., with headquarters at McAlester, Okla. In 1906 he became general manager of the Great Western and the Osage Coal companies. He continued in this position five years.

In 1911 Mr. Reid accepted a place as general manager of the Chinook Coal Co., Ltd., of Canada. He still holds that position with this corporation and has his headquarters at Lethbridge, Alberta.

He is an active figure in the councils of the coal-mine operators of Alberta Province, and is vice-president of the Western Coal Operators' Association. He is also a member of the Canadian Mining Institute.

Coal Corporation, operating in Kentucky, but incorporated in Wyoming. Mr. Moss was later advanced to the position of vice-president and general manager of the Continental company and still retains that position. He is the retiring president of the Kentucky Mining Institute.

Among other positions, Mr. Moss is president of the Moss & Sons Coal Co.; president of the Straight Creek Fuel Co.; vice-president of the Moss Coal Mining Co.; director of the Wilhoit Coal Co., and director of the Pineville Building & Amusement Co.

Mr. Moss has served as mayor of the city of Pineville, and is a member of the Kokoals and Southern Appalachian Coal Operators' Association.

Legal Department

Recent Decisions

By A. L. H. STREET*

Reformation of Contract on Ground of Mistake—In order to entitle a person to maintain a suit to reform the language of a written contract on the ground of mistake, there must be clear and satisfactory proof that a mistake has been actually made. (Kentucky Court of Appeals, Rockport Coal Co. vs. Carter, 163 Southwestern Reporter 734.)

Liability Concerning Vicious Mules—If a mine operator knows that a particular mule used in a mine is vicious and dangerous, he will be liable for any injury resulting from that cause to a miner who does not know the danger, notwithstanding any inherent unreliability of mules. (Kentucky Court of Appeals, Gatliff Coal Co. vs. Wright, 163 Southwestern Reporter 1110.)

Recovery of Taxes Unlawfully Assessed—"Taxes voluntarily paid or paid under protest cannot be recovered without some statute authorizing the recovery." The laws of Indiana require refund of taxes voluntarily paid under an erroneous assessment, if proof of such payment and of the improper assessment is made before the board of County Commissioners. (Indiana Supreme Court, Jackson Hill Coal & Coke Co. vs. Board of Commissioners of Sullivan County, 104 Northeastern Reporter, 497.)

When Operator Is Not Liable for Falling Slate—At last here's a case where a coal-mining company has been declared not to have been responsible for injury to a miner, caused by falling slate: A miner cannot recover for injury sustained through a fall of slate at his place of work, if he knew the necessity for propping the roof, but failed to do so, although props were provided for his use. (Kentucky Court of Appeals, Branson vs. Clover Fork Coal Co., 164 Southwestern Reporter 304.)

Warning Miners against Unsafe Roofs—When miners are directed by their boss to work at a certain place, they are entitled to assume that the place is safe in the absence of knowledge to the contrary. In a suit for injury to a miner caused by rock falling from a roof, it is no defense to show that the nature of the work contributed in some degree to the accident. But, if the place was reasonably safe, and the fall was caused merely by carrying on the work, the employer is not liable. (Kentucky Court of Appeals, Jellico Coal Mining Co. vs. Hilton, 163 Southwestern Reporter 744.)

Right to Rescind Purchase of Coal Lands—One who has contracted to purchase lands supposed to contain valuable beds of coal is entitled to rescind his agreement on discovering the falsity of willful or reckless misrepresentations as to the character of the land, made by representatives of the seller. Even though the owner did not authorize the perpetration of the fraud, he ratifies his representatives' acts in making the misrepresentations, by retaining payments made on the price by the purchaser. (Missouri Supreme Court, Morgan County Coal Co. vs. Halderman, 163 Southwestern Reporter 828.)

Instruments Which Must Be in Writing—An owner of land is not bound by a contract to sell it made by a third person as his agent, unless the agent's authority to make the contract was conferred by a writing signed by the owner, or unless the owner afterward signed an instrument ratifying the agreement. A receipt for a payment made on the purchase price of a tract of land is ineffectual as written evidence of the owner's contract to sell, if it does not describe the land nor disclose the parties to the agreement and the terms of sale. (Pennsylvania Supreme Court, Llewellyn vs. Sunnyside Coal Co., 89 Atlantic Reporter 575.)

Coal Not "Material" for Improvement—A seller of coal to be used by a State highway contractor in producing steam in road rollers and traction engines, utilized in performing a contract, is not entitled to the protection of the New York law, which gives a lien against funds in the hands of a contractor to secure payment for "materials" furnished him for the construction of a public improvement. (New York

Court of Appeals, Shultz vs. C. H. Quereau Co., 104 Northeastern Reporter 621). In reaching this decision the New York Court cites similar holdings by the Massachusetts Supreme Judicial Court.

Safety of Mine Room Neck—Damages Recoverable for Personal Injury—A miner can recover against his employer for injury sustained through fall of rock from a room neck through which he was required to pass, if the employer failed to take reasonable precautions to make the place safe. Four thousand five hundred dollars is not excessive recovery for such an accident, it appearing that the injured miner is 43 years old and has previously earned from \$50 to \$75 fortnightly, that his leg was broken, his ankle badly crushed, and he has been unable to work for more than two years. (St. Louis Court of Appeals, Gambino vs. Manufacturers' Coal & Coke Co., 164 Southwestern Reporter 264.)

Damages for Breach of Mining Contract—Under a contract whereby a party undertakes to mine coal for agreed compensation, according to the quantity mined and the length of entries and breakthroughs driven, he is entitled to treat the contract as broken by the mine owner, and sue for damages for the breach, as well as for compensation due on showing that the owner refused to pay sums due or to permit further performance. The measure of damages for breach of such a contract is the difference between the cost of performing the contract and the agreed price. (West Virginia Supreme Court of Appeals, Bare vs. Victoria Coal & Coke Co., 80 South-eastern Reporter 940.)

Excessive Freight Charges as "Extortion"—Under the statutes of Kentucky, charging by a railway company of an unreasonably high freight rate on interstate shipments of coal constitutes extortion, and, on a finding of such extortion, the State Railroad Commission is authorized to fix a reasonable rate. When the Commission finds that an existing rate is unreasonable, an aggrieved shipper need not prove actual damages, in order to be entitled to recover the difference between the rate charged and that fixed by the Commission as being reasonable. (Kentucky Court of Appeals, Illinois Central R.R. Co. vs. Paducah Brewing Co., 163 Southwestern Reporter 239.)

Effect of Wyoming Mine-Foreman Law—The Wyoming statute which provides for the inspection of coal mines by licensed foremen does not relieve operators of the duty of using a reasonable degree of care to provide a safe place of work for the miners. In entering upon employment, a miner assumes all risks of injury of which he knows or which he would discover by exercising ordinary prudence for his own safety. The burden of inspecting appliances and places of work may be placed on the employees using them. Thus an operator may impose on a machine runner the duty of assisting in cleaning up coal after a blast and in taking down loose coal near his place of work. (United States Circuit Court of Appeals, Eighth Circuit; Owl Creek Coal Co. vs. Goleb; 210 Federal Reporter 209.)

Penalty for Refusing to Permit Survey of Mine—A statute in force in Indiana authorizes an owner of land adjoining a tract on which a coal mine is being operated, and his surveyors, to enter the mine to make surveys in order to determine whether coal is being removed from beneath his land, and prescribes a penalty for refusal of the owner, lessee or operator of the mine to permit such survey. Held: "Penal statutes are always strictly construed, and to enable appellant to recover the penalty sued for he must make it appear that the substantial provisions contained in the foregoing statute have been violated. That is, he would be required to show not only that he owned land coterminous with the lands in the possession and control of appellee, either as owner, tenant, occupant, or agent, and that the coal mine sought to be surveyed was one that was open and being operated, such as is contemplated by the statute, but that some request had been made of appellee for a permit to enter his mine for the purpose of making such exploration, survey and measurements, and that such permission had been refused." (Indiana Appellate Court, Rowell vs. Snoddy, 104 Northeastern Reporter 104.)

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Discussion By Readers

Calorific Value and Volatility of Coal Dust as Affecting the Violence of Explosion

In connection with the question of the explosibility of anthracite dust, I note that a recent editorial writer takes exception to the statement in COAL AGE, Jan. 24, p. 172, which is as follows:

The scientific conclusion, therefore, is that the violence of a dust explosion depends not on the volatility of the coal, but on the calorific value of the dust. If this is true, anthracite dust, though difficult to inflame, will ultimately produce an explosion as violent as those produced by high-grade bituminous coals.

The criticism of this statement speaks of it as a fallacy," basing the opinion on the recent experiments with anthracite dust at Bruceton. I want to say, that all that the Bruceton experiments show is that anthracite dust, under the conditions of the experiment did not ignite. There is no warrant for the categorical conclusion being drawn that such dust cannot be ignited and burned explosively under other conditions than those that existed in that experiment.

The writer of this criticism did not apparently analyze the statement in COAL AGE sufficiently, since he failed to recognize that the *inflammation of the dust* and the *violence of the explosion*, should one occur, are two different propositions. Anthracite dust may be difficult to inflame, which explains the fact that the anthracite mines have been free from true dust explosions in the past. But this fact and the fact of the difficulty of its inflammation cannot affect, in the slightest degree, the statement in COAL AGE, that "the violence of a dust explosion depends on the calorific value of the dust."

It is worthy of note, moreover, that this statement does not say that the violence of a dust explosion depends *wholly* or *alone* on the calorific value of the dust. The statement simply draws attention to the fact that the calorific value of the dust is an important factor in respect to the violence of the explosion, should one occur.

In this connection, it is worthy of note that the percentage of volatile matter present in Iowa coals is as great or greater than the percentage of volatile matter in the coals of Pennsylvania or West Virginia; but the calorific value of the Iowa coals, per pound of coal, is far less than that of the other coals mentioned. Now observe that while there have been many ignitions in the mines of Iowa, the violence of the explosion has invariably been less than that of similar explosions in Pennsylvania or West Virginia. This fact has an important bearing on the question of the relative importance of the *calorific value* and the *volatility* of coal dust, as affecting the *violence* of the explosion, should one occur.

In closing, I want to call attention to what may rightly be considered the essential factor in developing the full calorific value of any combustible substance, whether anthracite, bituminous coal, methane or other gas. The answer is obviously *the presence of available oxygen in sufficient quantity to produce complete combustion*. For

example, a firedamp mixture (methane and air) develops its maximum violence in explosions when the proportion of gas to air is 1:9½, which is practically the proportion of gas and air required to produce complete combustion.

Anthracite dust under ordinary mining conditions has not proved to be explosive, and, in my judgment, under ordinary mining conditions, it cannot be exploded. But that is not to say that it *may* not be exploded under conditions of heat and air supply favorable for its combustion. It has been rightly stated that the magnitude of a dust explosion depends on the air supply. I believe it is this fact that limits the extent and violence of many mine explosions, because the air supply is limited by virtue of the environment.

The fact is well known that it requires more air to burn the same amount and grade of anthracite than to burn a like amount of bituminous coal. Then, if the air supply is generally insufficient to support the explosive combustion of dust in a bituminous mine, it will be still less sufficient for an explosion of dust in an anthracite mine. Again, inasmuch as anthracite dust is nonflaming, it may be assumed that the dust cloud must be of greater density than that required in the case of bituminous dust, in order to produce the same explosive effect. To burn this comparatively dense cloud of anthracite dust would require an unusually hot and lasting flame and an oxygen supply far above what can be obtained in any mine, under ordinary conditions.

JOHN VERNER,
Former State Mine Inspector.

Chariton, Iowa.

Weak Links in Coal Mining

Letter No. 1—I was interested in reading the article on this subject, COAL AGE, May 9, p. 756, as it calls to mind another weak link in the operation of coal mines that the writer has failed to mention. I refer to the misuse and reckless handling of mine motors by motormen in the mines. Motormen, as a class, like mule drivers, are a fearless and often reckless type of men. The spirit that mostly animates these fellows often leads them to a misuse of the electrical power and unduly overloads the motor, especially in starting a heavy trip when great caution should be used. In making the run to the shaft bottom, they often exceed the speed limit, causing cars to jump the track and even endangering their own lives by taking a sharp curve too fast or when passing a known piece of bad track.

The mine electric locomotive, unlike a railway engine, has a low center of gravity, which gives the motorman greater confidence, and he takes the curve at too high a speed, forgetting that the great strain thrown on the rails may cause them to spread and derail the trip.

The greatest trouble, however, arises from the tendency of motormen to use little or no caution in starting a trip of loaded cars. A careful man will sand the rail before

taking the slack out of his train. This puts the motor on a sanded rail before the full load is started and enables the motorman, by working the controller, to operate the locomotive to the best advantage, giving the motor more or less current according as the wheels hold the rail or slip.

Too often, a careless motorman will turn on the full current before slack is taken in the attempt to jerk the slack out of the train, which he believes will start the load better. Having started the load in this manner, he will often sit quiet and control the speed of the train by use of the motor brakes. If the wheels slip, he applies the motor brake to overcome the difficulty, instead of regulating the current, loosening them again to gain speed.

It seems hard to accuse competent men of such practice, but too often I have witnessed the trick while hidden from sight in the gob. I have frequently surprised a motorman in the act.

Many mines using electric haulage are troubled with excessive repair bills when there is no apparent reason for the breakage of axles, wheel flanges and other parts. The reason for these unnecessary breakages would often be discovered if the person in charge would make frequent trips of inspection in the mine, at times when he is not expected to be there. If a broken axle shows no flaw in the fracture and there is no defect visible in its mounting, the trouble is either due to an unwarranted strain caused by such practices as I have mentioned, or, which is possible, there may be too much lateral motion across the track, which causes the motor frame to bump hard against the hub of the wheel, producing, finally, "fatigue" or crystallization in the metal. In mining practice, the wear and tear on the locomotive, due to this cause, are apt to be great, under the best conditions. owing to frequent change in the level of the track, which causes the locomotive to swing from side to side with great frequency. Such a side swing, at a high speed, results in a solid, heavy hammer-blow on the axle. Where there is much end-play in the journal, collars or washers should be used to take up this play. I have seen several cases where the journal box was worn clear through next to the wheel hub and allowed the oil to ooze out of the bearing. The same cause results in broken wheel flanges also.

ASSISTANT SUPERINTENDENT.

—, Ala.

Double-Neck Rooms

A recent reference in COAL AGE calls to mind a good practice that I observed in the Alabama coal field, about a year ago, which I desire to commend.

The coal seam, in the mine in question, was about four feet in thickness and dipped at an angle of about 8 or 10 deg. with the horizontal. The rooms were turned straight up the pitch and driven with a width of about forty feet. Each room had two necks or openings, with a pillar stump between them. The waste resulting from the partings or clay seams, which occurred in the coal, was used to build a solid wall along each roadway. The entire space between the two roadways, from floor to roof, was filled with the waste of the seam, extending from the entry stump at the mouth of the room, to within about 5 ft. of the face.

A canvas sheet was hung across the entry between the two room-necks; and the air current thus carried up to the face of the room swept the gas away as fast as it was generated. By this method, all the dirt was stored in the mine, where it belonged, and was not hauled to the surface, which saved a considerable expense. Moreover the method served to aid the ventilation of the rooms. This system could be used to great advantage in other coal seams that present like conditions. It has the advantage of being automatic, and with proper attention from the mine foreman and fireboss, no accumulation of gas can occur in the rooms.

J. J. RUTLEDGE.

McAlester, Okla.

The Mine Foreman

Letter No. 7—The discussion, in COAL AGE, of the somewhat anomalous position of the mine foreman in the coal-mining industry has been interesting. The question is one of such vital importance to all mine foremen that it should receive serious consideration. It is to be hoped that, by thus drawing attention to certain prevailing features, this discussion may be the means of improving conditions and giving to honest mine foremen a greater degree of prestige, security and justice than is accorded them under the present system and statutory laws.

It is quite generally acknowledged that the mine foreman today occupies an onerous position. In most cases, he is held to a strict accounting by three masters—the state law, his employers and the miners, for whose safety he is responsible. Let us consider each of these in order.

First. In most coal-mining states the mine foreman is held legally responsible for the safe operation of the mine in compliance with the requirements of the mining law. In some cases, these requirements place him in a very difficult situation. For example, the bituminous mining law of Pennsylvania (Art. 4) reads as follows:

The mine foreman shall have full charge of all the inside workings and of the persons employed therein, in order that all of the provisions of this act, so far as they relate to his duties, shall be complied with and the regulations prescribed for each class of workmen under his charge carried out in the strictest manner possible. * * *

When the mine workings become so extensive that the mine foreman is unable personally to carry out the requirements of this act pertaining to his duties, he shall have the right to employ a sufficient number of competent persons to act as his assistants, who shall act under his instructions in carrying out the provisions of this act. * * *

The mine foreman shall notify the superintendent in writing, whenever, in his opinion, the mine is becoming dangerous through the lack of ample ventilation * * * or from any other cause, etc.

The foreman is further required to remove all dangers found or reported to him as existing in the mine, or withdraw the men working therein. Consider the dilemma the mine foreman must face when his reports do not meet with the approval of the superintendent. As foreman, he is liable to prosecution by the state inspector, for a violation of the law, if he fails to see that all its requirements are fulfilled. As was remarked incidentally by a state mining official, at the time of the Harwick mine disaster, Jan. 25, 1904, "the foreman is certainly between the devil and deep sea."

The question may well be asked: Can a mine foreman be conscientious and, at the same time, be assured of his position, under these conditions? Any prevarication

will render him liable to prosecution, in the event of serious consequences. On the other hand, the law provides no redress for loss of position through the faithful performance of his obligation to the state; it considers no extenuating circumstances as an excuse for any violation of its mandates. The mine foreman may have used every moral suasion in his power to secure compliance of the company who employs him, with the requirements of the law; but the law takes no cognizance of such fact. It holds the unfortunate foreman legally responsible for any nonconformity to legal requirements in the operation of the mine in his charge.

Second. By his employer, the mine foreman is regarded in the light of a "coal-getter." He is held responsible by him for the daily output of coal and the cost of its production. On this basis, it would naturally be supposed that the foreman's practical knowledge would be worthy of the first consideration; but how often are his suggestions and requests set aside, in respect to even minor details dictated by his more intimate acquaintance with the actual practical need.

The superintendent's eye is ever on the cost sheet, and while this is a very important item and is indisputably his province and duty, it often transpires that a too prolific use of the pruning knife may prove unwise economy. But the mine foreman is still required to produce the

goods and, in many cases, it is not only a case of "making bricks without straw," but the hands of the foreman are practically tied by other curtailments that render him virtually helpless. Of course, the foreman "need not submit to these conditions"; he is at liberty to quit, but how often is he in a position to do so?

Third. In respect to the third master—the miner—little need be said, as the relations between the foreman and his men are too well known to need further comment.

In closing, I would ask: Is it justice to make the mine foreman responsible for affairs over which he has no control, except by jeopardizing the position he holds? A solution to this question (which justice to a large class of faithful, conscientious foremen demands) might be found, as was suggested in COAL AGE some time ago (Vol. 1, pp. 190 and 717), in reference to the fireboss, by making the mine foreman a state official. Under present conditions, the mine foreman has neither social standing nor professional prestige. In some respects, he is debarred from full association with the miners whom he employs, while his rank seldom insures recognition by his superiors. The situation certainly needs to be carefully studied, with a view to improving present conditions.

I. C. PARFITT.

Jerome, Penn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Example—An air current of 60,000 cu.ft. per min. is passing in an airway 8x10 ft. in section, to a point 1500 ft. distant from the foot of the downcast shaft, where it divides naturally between the following four airways or splits:

Split A,	5 x 6 ft., 900 ft. long
Split B,	6 x 6 ft., 825 ft. long
Split C,	4 x 6 ft., 840 ft. long
Split D,	4 x 5 ft., 720 ft. long

What is the quantity of air passing in each split; and what will be the water-gage reading for the entire mine and power on the air, at the foot of the downcast shaft?

Solution—Since the water gage is required in this case, the relative potential values cannot be used; but, instead, the part potential value (omitting k) is found for the main airway and for each split separately; thus, taking the length of the main airway including the return as $2 \times 1500 = 3000$ ft.:

Main airway,	$a = 80; o = 36; l = 3000; X_1 = 80 \sqrt{\frac{80}{3000 \times 36}} = 2.177$
Split A,	$a = 30; o = 22; l = 900; X_a = 30 \sqrt{\frac{30}{900 \times 22}} = 1.168$
Split B,	$a = 36; o = 24; l = 825; X_b = 36 \sqrt{\frac{36}{825 \times 24}} = 1.531$
Split C,	$a = 24; o = 20; l = 840; X_c = 24 \sqrt{\frac{24}{840 \times 20}} = 0.907$
Split D,	$a = 20; o = 18; l = 720; X_d = 20 \sqrt{\frac{20}{720 \times 18}} = 0.786$

The general split potential (X_{so}) is equal to the sum of the potentials for the four splits; thus,

$$X_{so} = \Sigma X_{abcd} = 4.392$$

The quantity of air that will pass in each of these splits is proportional to the corresponding split potential, assuming that no regulators are employed but all the airways are free and unobstructed. The natural division of the air between the four splits is therefore calculated in the usual manner, as follows:

Split A,	$q_a = 60,000 \frac{1.168}{4.392} = 15,950$ cu.ft. per min.
Split B,	$q_b = 60,000 \frac{1.531}{4.392} = 20,920$ cu.ft. per min.
Split C,	$q_c = 60,000 \frac{0.907}{4.392} = 12,390$ cu.ft. per min.
Split D,	$q_d = 60,000 \frac{0.786}{4.392} = 10,740$ cu.ft. per min.

Total circulation, 60,000 cu.ft. per min.

The Coal Age Pocket Book

In order to find the water-gage reading at the foot of the downcast shaft, for this circulation, it is necessary to calculate the general mine potential X_o by combining, in tandem, the main-airway potential (X_1) and the general split potential (X_{so}) previously found, using the formula

$$\text{Mine water gage, } w.g. = \frac{k Q^2}{5.2} \Sigma \left(\frac{1}{X^2 p} \right)$$

Substituting the values previously found,

$$\text{Main airway, } \frac{1}{X_1^2} = \frac{1}{2.177^2} = 0.2109$$

$$\text{Split section, } \frac{1}{X_{so}^2} = \frac{1}{4.392^2} = 0.0518$$

$$\text{Sum of values, } \Sigma (1/X^2 p) = 0.2627$$

Finally, substituting this value in the above formula for finding the mine water gage,

$$w.g. = \frac{0.00000002 \times 60,000^2 \times 0.2627}{5.2} = 3.64 \text{ in.}$$

In like manner, the power on the air, at the foot of the shaft is calculated by the formula

$$\text{Power on the air, } H = \frac{k Q^3}{33,000} \Sigma \left(\frac{1}{X^2 p} \right) = \frac{0.00000002 \times 60,000^3 \times 0.2627}{33,000} = 34.39 \text{ hp.}$$

Increase of Quantity Due to Splitting—The quantity of air in circulation is proportional to the general mine potential; or, in other words, the quantity is always equal to the mine-potential ratio; the power potential being used for a constant power, and the pressure potential for a constant pressure; always remembering, however, that the cube of the power potential is equal to the square of the pressure potential. Denoting the original quantity of air in circulation, by Q_1 and the original mine potentials for power and pressure by X_{u1} and X_{p1} , respectively; and designating these factors after splitting, by Q_2 , X_{u2} and X_{p2} , respectively, gives the following formulas:

$$\text{Power constant, } Q_2 = Q_1 \frac{X_{u2}}{X_{u1}}; \text{ or } Q_2 = Q_1 \sqrt[3]{\left(\frac{X_{p2}}{X_{p1}} \right)^2}$$

$$\text{Pressure constant, } Q_2 = Q_1 \frac{X_{p2}}{X_{p1}}; \text{ or } Q_2 = Q_1 \sqrt[3]{\left(\frac{X_{u2}}{X_{u1}} \right)^2}$$

An illustration of the use of these formulas is to be found in the solution of the first example under Secondary Splitting, on a previous page. In that example, the power remained constant before and after splitting the current. The pressure potential was used, which before splitting was $X_{p1} = 0.6708$, and after splitting, $X_{p2} = 0.8554$:

$$\text{Hence, } Q_2 = Q_1 \sqrt[3]{\left(\frac{X_{p2}}{X_{p1}} \right)^2} = 120,000 \sqrt[3]{\left(\frac{0.8554}{0.6708} \right)^2} = 141,100 \text{ cu.ft. per min.}$$

Inquiries of General Interest

Study Question--Ventilation

The following question, which appeared in one of the recent examinations in British Columbia, has excited a great deal of interest. We have been studying the question carefully and would very much appreciate an answer in COAL AGE. The question assumes that, with a constant power, the circulation is to be increased by dividing the air into three separate currents. It is as follows:

Suppose that a given power circulates 75,000 cu.ft. of air per minute through a certain airway, in a continuous current; and it is decided to divide the air into three splits as follows:

- Split A, 6 × 6 ft., 5000 ft. long;
- Split B, 5 × 6 ft., 4500 ft. long;
- Split C, 6 × 7 ft., 4000 ft. long.

Calculate the quantity of air that will pass in each split, assuming that the power on the air remains unchanged.

DAVID MURRAY.

Blairmore, Alta., Canada.

The first step in the solution of this question is to find the power that will circulate 75,000 cu.ft. of air per minute in the given airways, in a continuous current or a "tandem" circulation.

The area (*a*), perimeter (*o*) and length (*l*) of these three airways or sections are, respectively;

- Split A, *a* = 36; *o* = 24; *l* = 5000;
- Split B, *a* = 30; *o* = 22; *l* = 4500;
- Split C, *a* = 42; *o* = 26; *l* = 4000.

The part potential values of the airways are then found as follows:

$$\text{Split A, } Xp_1 = 36 \sqrt{\frac{36}{5000 \times 24}} = 36 \sqrt{0.000300} = 0.6235$$

$$\text{Split B, } Xp_2 = 30 \sqrt{\frac{30}{4500 \times 22}} = 30 \sqrt{0.000303} = 0.5222$$

$$\text{Split C, } Xp_3 = 42 \sqrt{\frac{42}{4000 \times 26}} = 42 \sqrt{0.000404} = 0.8440$$

Sum of part potentials, $\Sigma Xp \dots \dots 1.9897$

Setting aside this value of the sum of the part potentials for use, later, in the calculation of the split circulation, we next find the reciprocal of the squares of each of the above potential values and take their sum for the calculation of the power in the tandem circulation. Thus,

$$1/X^2p_1 = 1/0.6235^2 = 2.5721$$

$$1/X^2p_2 = 1/0.5222^2 = 3.6668$$

$$1/X^2p_3 = 1/0.8440^2 = 1.4037$$

Sum of tandem values, $\Sigma (1/X^2p^2) \dots 7.6426$

The general formulas for calculating the power on the air from the mine-pressure potential, for tandem and split circulations, respectively, are as follows:

$$\text{Tandem circulation, } U = kQ_1^3 \Sigma \left(\frac{1}{Xp^2} \right)$$

$$\text{Split circulation, } U = kQ_3^3 \left(\frac{1}{\Sigma Xp} \right)^2$$

The power on the air can, now, be calculated by substituting the necessary potential values in the first of these two formulas; and, then, by substituting this result for *U*, in the second formula, the total quantity of air in circulation in the splits can be calculated. The distribution of this total quantity between the three splits can then be calculated in the usual manner.

Much time and labor in calculation, however, is saved by equating the two equations given above, which is possible because the power on the air remains constant. Doing this and then canceling the common factors and solving with respect to *Q*₂ gives, for finding the total quantity of air circulated by the same power, in the splits, the following formula:

$$Q_2 = Q_1 \sqrt[3]{(\Sigma Xp)^2 \Sigma (1/Xp^2)}$$

The total quantity of air circulating in the splits, as found by this formula, is then,

$$Q_2 = 75,000 \sqrt[3]{1.9897^2 \times 7.6426} = 233,710 \text{ cu.ft. per min.}$$

The distribution of this air between the three splits can then be calculated in the usual manner. A shorter method still, however, is to calculate the quantity of air passing in each of the several splits directly, by use of the following formula:

$$q_1 = Xp_1 Q_1 \sqrt[3]{\Sigma (1/Xp^2) \div \Sigma Xp}$$

For example, substituting, in turn, the respective potential values, previously found, and making *Q* = 75,000, the quantity of air passing in each of the three given splits, under a constant power, is as follows:

$$\text{Split A, } q_1 = 0.6235 \times 75,000 \sqrt[3]{\frac{7.6426}{1.9897}} = 73,240 \text{ cu.ft. per min.}$$

$$\text{Split B, } q_2 = 0.5222 \times 75,000 \sqrt[3]{\frac{7.6426}{1.9897}} = 61,340 \text{ cu.ft. per min.}$$

$$\text{Split C, } q_3 = 0.8440 \times 75,000 \sqrt[3]{\frac{7.6426}{1.9897}} = 99,130 \text{ cu.ft. per min.}$$

Total circulation, 233,710 cu.ft. per min.

This is an extremely difficult question for an examination question, because the method of its solution is not generally understood. Many students of mine ventilation, will, no doubt, prefer to work this example by the customary long and tedious process of calculating the power on the air in the first circulation, using the coefficient of friction *k* = 0.00000002; and then, by the use of the same coefficient, find what quantity of air the same power will circulate in the splits. The last two formulas eliminate *k* and shorten the solution.

Examination Questions

Pennsylvania Bituminous Mine Foremen's Examination, May 5 and 6, 1914

(Continued from last issue)

Ques. 7—(a) What is a permissible explosive? (b) What conditions make their use necessary in a mine? (c) What charge limit has been established by the U. S. Bureau of Mines, for such explosives?

Ans.—(a) Miners' Circular No. 6, of the Federal Bureau of Mines, p. 8, defines a permissible explosive as one that is in all respects similar to the sample that passed certain tests made by the U. S. Bureau of Mines, and when used in accordance with the conditions prescribed by that bureau.

(b) The presence of gas in sufficient quantity to be detected on an ordinary safety lamp, in a dry and dusty mine, makes the use of a permissible explosive advisable, if not absolutely necessary to avoid the danger of an explosion being produced by the flame of black powder so commonly used for blasting coal.

(c) The charge limit for a permissible explosive, as stated in the fourth condition of its use, on p. 9, of Miners' Circular No. 6, is $1\frac{1}{2}$ lb. (680 grams); and this must be properly tamped with clay or other noncombustible stemming.

*Ques. 8—*What are the legal requirements as to cut-throughs in rooms, and what supplies should be kept at the face of working places?

*Ans.—*Art. 9, Sec. 3, of the bituminous (Penn.) mine law, requires that cut-throughs shall be made in all room pillars, at such distances apart as the judgment of the inspector may deem requisite, not more than 35 nor less than 16 yd., for the purpose of ventilation. The law provides that every miner shall order all the props, cap-pieces and other timbers required to keep his place in safe condition, at least one day in advance. It is important to keep a good supply of such timbers and cap-pieces constantly on hand, ready for use when required.

*Ques. 9—*What provision should be made for safety on haulage roads, and what appliances should be used in connection with the different mechanical systems of haulage, including the hoisting equipment?

*Ans.—*The bituminous (Penn.) mine law, Art. 4, Sec. 8, provides that all entries hereafter driven shall have a clear space of $2\frac{1}{2}$ ft. between the side of the car and the rib of the entry, continued throughout on one side of the entry, provided the roof will permit such a width. On other haulage roads, the law requires that shelter holes $2\frac{1}{2}$ ft. deep and 4 ft. wide shall be cut in the rib on one side of the entry, at distances apart not exceeding 30 yd., where animal haulage is employed, and not exceeding 15 yd. where the hauling is performed by machinery. Such shelter holes must be kept whitewashed and free of all obstruction. They are not required on entries where rooms are turned off on one side of the road, at intervals not greater than the distances mentioned in the law.

Art. 3, Sec. 6, provides that a safety catch, or other safety device, be attached to the rear end of the rear car of full trips that are to be hoisted up slopes; also, that suitable signals be placed on the rear end of the rear car of all trips hauled in the mine by locomotives of any kind. Art. 6, Sec. 4, provides that where the main intake airway is used for mechanical haulage, a separate traveling way shall be provided or the employees shall be hauled in and out of the mine at the beginning and end of each shift.

Art. 6 provides for stairways on an angle not to exceed 45 deg. and equipped with handrails, in all shafts less than 100 ft. in depth. Art. 7 provides for the lowering and hoisting of employees by means of machinery, in shafts exceeding 100 ft. in depth, except where the second opening is a drift or slope. In such mines, if the second opening is a shaft, the same must be provided with a stairway, as described in Sec. 6. Sec. 8 provides that employees shall be lowered and hoisted from the mine, at the beginning and end of each shift, at a speed not to exceed 6 miles per hour, in all slopes exceeding 15 deg. inclination and 1000 ft. in length. The same provision is made for slopes whose average inclination is from 5 to 15 deg. when the length exceeds 3000 ft., except where a separate traveling way is provided, when the hoisting of employees is optional, provided the angle of inclination does not exceed 20 deg.

Art. 8 provides for the installment of suitable signal apparatus and communication by speaking tube or by telephone, between the top and the bottom of every shaft or slope where persons or material are lowered or hoisted. It is also provided that every cage for lowering or hoisting men shall be equipped with handrails at the sides or overhead, and with chain, bar or gate at ends of cage, and a sufficient covering overhead to protect persons thereon; also, safety catches to be tested every two months, and a record of each test sent to the inspector and recorded in ink in a book at the office.

The hoisting rope shall be attached securely to the sides of the winding drum, which must be provided with flanges having a clearance of not less than 4 in. after all the rope is wound on the drum. An adequate brake must be attached to each drum and an indicator provided to show position of cage in shaft; also, an efficient safety device to prevent overwinding. All shafts shall be provided with safety gates at the top and intermediate landings.

Secs. 2 and 3 provide for the strength of coupling chains, bridle chains, ropes and links required in the hoisting equipment. All machinery (Sec. 4) must be properly fenced with a suitable guardrail. The number of persons that may be hoisted (Sec. 5) at one time shall be determined by the mine inspector and posted in a conspicuous place; the speed of hoisting not to exceed 900 ft. per min. Art. 4, Sec. 21, provides for the use of safety blocks, safety switches, drop logs or other device, at the top of all slopes and shafts, to prevent cars from running into the opening.

Coal and Coke News

Washington, D. C.

As a result of the constant agitation during the past two or three sessions of Congress for the establishment of mining experiment and mine safety stations practically identical bills providing for the creation of a number of such stations have been reported to the Senate and House by the mining committees of those bodies.

It is believed that the bill will be adopted before the expiration of the present Congress. Under its terms there would be 10 mining-experiment stations in public-land states and 15 safety stations on the rescue cars designed to carry out the educational work of the Bureau of Mines with reference to accident prevention, as well as to afford facilities for the actual relief of those suffering from mine accidents. In addition the provision is made for the operation of the 8 mine-rescue cars now in commission, upon a new basis.

The committee in making its report to the House says that the bill has been prepared with considerable care and that it is not based upon the plans or wishes of any one person or organization, but has been drawn up as the result of a series of conferences among mine owners, operators, miners, engineers and surgeons from different parts of the country.

Conditions showing the need for this legislation are stated and much is made of the reduction in the number of men employed in the different metal-mining industries in the public-land states. The average number of employees, it is pointed out in the metal-mining and metallurgical industries in Colorado, for instance, for the four-year period 1900-1903 was 36,189. In the period 1908-1911 this number was reduced to 22,560.

In the opinion of the committee something is the matter with mine development, and it says in its report:

Among the causes of this lagging behind of mine development are the following: (a) The exhaustion now under way of the more easily discovered and richer ore deposits and the fact that other similar deposits are not now being discovered to such an extent as to replace those now being worked as they become exhausted; (b) the absence of known methods through the use of which many existing low-grade ore deposits can be profitably worked; (c) the wasteful methods now followed in many of the mining and metallurgical operations, which, while in many cases still bring temporary profits to mine operators, are reducing the national wealth in a manner which can be remedied only by the discovery and use of more efficient methods of treatment.

No one likes to estimate the money value of a human life, but at times it becomes necessary to do this, especially in working out the economics of compensation acts. It is a reasonable estimate that during the past 10 years more than 30,000 men have been killed and more than 100,000 seriously injured in connection with the accidents in the mining industries of this country.

It is impossible to estimate the number who have suffered from unhealthful conditions in many metal-mining, tunneling, quarrying, metallurgical and other mineral-industry plants. It is impossible to estimate the number of men with health shattered through these conditions who have had to give up their work years before their natural time or the number of dependents who have suffered thereby.

If it be assumed that each human life is valued at \$3000, it will be seen that the deaths alone in the mines have cost in 10 years \$90,000,000.

If each of the 100,000 seriously injured lost 20 days at \$3 per day, a reasonable assumption, this represents \$6,000,000 lost from this cause.

It is important from both the humanitarian and economic standpoints that the investigations by the national Government with a view to better safeguarding the lives of the men connected with the more hazardous branches of the mining industry should be conducted as thoroughly and as rapidly as the work can be done effectively, in order that improvements may be inaugurated without delay and to the fullest possible extent.

It is equally important that after the inquiries and investigations have been conducted and reasonable conclusions formed that information should be disseminated promptly and effectively among the miners and those who manage the mines.

The Leasing System in Alaska

Complying with a Senate resolution, a document relating to the leasing of coal lands in foreign countries by T. P. McDonald has been published by the Government Printing Office. This document reviews the situation of the purchase system for coal lands in the United States and the experience in leasing coal lands here and abroad. The general tenor of the document is in favor of leasing and at the close the following statement is made:

The history of the coal-mining industry in all these countries operating exclusively under the leasing system proves that the investment of the coal-mine operator is far safer than under our system of a wide distribution of ownership and the keen competition that is inevitable under our present laws.

The title to the coal land being vested in the Government, it is thereby able to prevent overdevelopment and overproduction, which overproduction in turn produces destructive competition. Under this system the Government will only lease sufficient coal land to supply the existing market and provide for its effective extension and will be able to protect the coal operator against destructive competition. Under such a law, there is no question but the capital to develop Alaska coal lands will be available.

The experience of the coal producers in our great bituminous fields for the past 20 years demonstrates the necessity of some power to prevent the destructive competition that has so demoralized coal-mining investments during that time. In Australia, New Zealand and Nova Scotia the price of coal at the pit mouth during the past 20 years has ranged from \$1.75 to \$2.25 per ton, while in our great bituminous districts the price of coal at pit mouth has ranged from 90c. to \$1.11 per ton. We are exhausting our great fields of high-grade fuel at almost actual cost of production.

Here are the figures taken from the report of the United States Geological Survey for 1911, for the states mentioned, showing the tonnage and selling price at mine:

States	Tons	Price At Mine
Illinois	53,679,118	\$1.11
Indiana	14,201,355	1.08
Pennsylvania	144,754,163	1.01
Ohio	30,759,986	1.03
West Virginia	59,531,580	0.90

These figures illustrate the evil inherent in a wide distribution of ownership of coal lands. It results in such keen competition that the profits of the operator are reduced to the minimum, and where mining conditions are at all adverse are often extinguished.

The leasing system for Alaska, to encourage the development of the coal-mining industry, should provide that the coal producers may combine to fix a reasonable selling price for their coal. Possibly it should provide that such agreed price should, after a proper showing, be approved by the Alaska Development Board. Certainly some provision should be made to protect the investor from ruinous competition, either by permitting a selling price to be fixed by mutual agreement between the operators, as is done in other countries operating under lease, or the Government should protect the operator by limiting the number of leases in any particular field, so that a market may be assured for a reasonable tonnage. Some inducement must be extended to the operator with capital to justify him in developing those coal fields.

HARRISBURG, PENN.

The Supreme Court on May 23, in an opinion handed down by Justice Elkins, affirmed the Luzerne County Court in the 1913 assessment made by the Board of County Assessors which was attacked by the Delaware, Lackawanna & Western R.R. Co. The lower court held that equity had no jurisdiction and that the question of valuation should come up on appeal. An appeal is now pending in the lower court, which will have to be disposed of before the valuation question is finally settled.

The attack upon the assessment was brought by the Lackawanna company against the Luzerne County Board of Assessors, Plymouth Township. Had the court held that equity had jurisdiction, the question would tie up the taxes in all municipalities of the county.

The company objected to paying a special tax levied in Plymouth Township, claiming that the assessment was illegally made. The attack of the coal company was not merely to evade paying the tax in the township, but to test the validity of the county assessment, which increased the valuation many millions of dollars, the coal land being almost doubled in assessed value. The company claimed the assessment was illegal, because it was a blanket one and that the per-foot-acre method was used; also that land was assessed in bulk, the noncontiguous coal land being assessed and bulked together. One of the chief contentions, also, was that the subassessors did not make the assessment.

The company asked the lower court to grant an injunction, restraining the tax collector of Plymouth Township from collecting the tax complained of.

The Embarrassment of Industrial Railroads

The Public Service Commission on May 21 and 22 took up several new phases of the Industrial R.R. situation when it heard testimony from several steel companies and the Philadelphia, Bethlehem & New England R.R., which alleges that

before Apr. 15, 1914, it participated in through rates and division on all traffic except coal and coke.

The Interstate Commerce Commission has ruled differently from the State Commission, in the case of the Union and Monongahela Connecting railroads in the Pittsburgh district, which adds no small amount of interest to these hearings.

The state commission has followed the commission of New York in ordering the railways to continue their allowances to short industrial lines, which allowances in most cases have been declared by the Interstate Commerce Commission to be exorbitant and illegal, and which, so far as concerns the United States Steel Corporation and a few other large plants, have been discontinued on interstate traffic.

The apparent conflict between the views of the Federal and the state authorities on this matter is being closely watched by the bituminous operators. The essential point is the reasonableness of the compensation for the service of the industrial roads, and the Interstate Commerce Commission itself has postponed judgment in many cases. Evidently there is a long legal contest ahead, for not only the confusion of state and Federal authorities, but also that incident to all complicated freight-rate puzzles seems to afflict this controversy in a marked degree. The state is, however, committed irrevocably to the duty of making all transportation rates everywhere reasonable and just.

PENNSYLVANIA Anthracite

Plymouth—The strike inaugurated on May 16 at Nottingham No. 15 colliery, of the Lehigh & Wilkes-Barre Coal Co. has been settled, and work has been resumed. The miners quit on account of the discharge of two drivers for violating the rule of the company in riding mules underground.

The settlement in the Red Ash vein Gaylord colliery, Kingston Coal Co. continues, but every effort is being put forth to counteract its effect. Timbers of large size are being placed, as well as concrete pillars. Thus far, surface property has not been affected. Work at the breaker, however, has been suspended until further notice.

Mocanaqua—The fire, which caused considerable excitement at the West Coal Co.'s mine at this place, has been conquered after some hard fighting. It was caused by a slight explosion of gas, and a number of men had a narrow escape from being burned.

Larksville—The second cave in the surface of Luzerne Ave. within two weeks occurred on May 23, and residents of the vicinity are somewhat alarmed. This last cave was caused by working in No. 2 colliery of the Kingston Coal Co. The large water main running through the town burst, causing the residents considerable inconvenience from lack of water.

Locust Gap—The employees of the Locust Mountain Coal Co., some 15,000 men and boys, on May 22, struck because of the discharge of two committeemen of the United Mine Workers of America and through dissatisfaction in the way the men are compelled to register daily on a new time clock.

Bituminous

Altoona—In an amicable proceeding begun by the state against the Alton Coal Co., a decree in quo warranto has been handed down by the Dauphin County Court, in which it was set forth that the company, because it is no longer doing business, be ousted of its charter privileges.

Connellsville—It is stated that, during the week ended May 21, three thousand coke ovens in the Connellsville region were blown out; 2200 of these were owned by the H. C. Frick Coke Co., a subsidiary of the United States Steel Corporation. Production throughout the region declined 17,000 tons, and it was reported that coke for delivery the second half of the year was being sold at a recession from the prevailing price of \$2.

WEST VIRGINIA

Moundsville—Following an examination of the mines in this vicinity, deputy state-mine inspectors have ordered that the working forces of the Parr's Run and Panama mines be reduced to 20 men, owing to the fact that the air shafts are not equipped with air gages. It is said that the whole plant of the Mound mine was ordered closed down, pending compliance with state laws.

Charleston—The records of the State Mining Department just published by Earle A. Henry, chief inspector, show that in the month of April there were 31 fatal accidents in the coal mines of West Virginia, being a gain of one over the previous month. The deaths resulting from the explosion in Mine No. 5 at Eccles are not considered in the regular casualty list. In this disaster there were 180 deaths, which brings the total up to 211 for the month.

Colliers—The striking miners at Colliers, where several riots have occurred, held a parade recently and marched

about the streets of the village. Contrary to expectations, no disorder was noted. The mine at this place is working, about 50 men being employed, and is furnishing sufficient coal to fill orders.

Fairmont—The West Virginia State Federation of Labor brought its seventh annual convention to a close May 21 by adopting a resolution asking that Governor Hatfield appoint a committee to revise the mining laws of the state. Charleston was chosen as the place for the next meeting.

Panther—The first car of coal to be shipped from the Panther Coal Co. was sent out on May 20. All the directors of the company, as well as some of their relatives and friends were present. This car was said to be one of the finest in appearance ever sent from this region.

ALABAMA

Birmingham—The Black Diamond Coal Mining Co., with offices in the Jefferson County Bank Building of Birmingham, will develop a new mine at Benoit, Ala. in Walker County. The mine will be operated electrically, and the company expects to install shortly motors, coal cutters, and a 150-kw. direct connected generator.

Russellville—The No. 7 washery of the Sloss-Sheffield Steel & Iron Co. at Russellville was put into operation on May 15. This is one of the two new washers which have just been built at a cost of about \$125,000. The other new one No. 6 washer was put into operation about the last of April.

KENTUCKY

Lexington—Announcement has been recently made that after a year's negotiation a deal has been consummated by which the East Jelico Mining Co. takes over all holdings of the East Jelico Coal Co. in Bell and Knox counties comprising 2800 acres of coal and timber land. The consideration paid was \$300,000 in cash. The present output of the mines is 1100 tons daily, and it is proposed to acquire, lease and develop new mining properties in that section of the state.

Morganfield—Local opinion is that the projected amalgamation of coal operations of Union County is about to be realized. A party of representatives of an English syndicate which is said to be interested in the project, has just paid a visit to the county and followed up the reports of the engineers as to the land and the mines. The chief engineer, who is 72 years of age, is as vigorous as a man of half his years.

Madisonville—Ten of the coal companies operating in this county have been fined a total of \$750 on their pleas in abatement to indictments charging that they polluted streams with copperas water from the mines. Fines were assessed without trial and the cases will be appealed.

Some twelve of the families of the striking miners of the Kingston Coal Co., at White City, have been evicted from their homes by the company. Fears that the miners would resist proved groundless.

OHIO

New Philadelphia—Leases have been closed by the Goshen Coal Co. to the Horger-Heldt Coal Co., the East Goshen Coal Co., and the Midvale Coal Co., by which the latter named concerns take over three separate coal properties. These leases provide for the payment of 6c. per ton mine run royalty, and each company must mine at least 30,000 tons yearly.

Columbus—The new mine rescue car purchased by the Ohio Commission some time ago, has arrived and is being equipped. It is an old Pullman furnished with a hospital and kitchen and will be placed in service when Ohio mines resume operation.

It is announced by Ohio operators who are backing the litigation, to have the new mine-run law declared unconstitutional that the case will be carried to the U. S. Supreme Court. Since the decision of the Federal Courts of Toledo refusing an injunction asked for by the operators, the only course is an appeal, and it is the intention to fight the case through the highest tribunal.

At the close of a conference between miners' representatives and coal operators in the office of Governor Cox, on May 22, it was announced that the operators and representatives of 45,000 idle miners in Ohio had agreed to meet in a mine-wage conference on June 2.

Toledo—A decision handed down from the U. S. Federal Court on May 19 upholds the constitutionality of the mine-run law. This measure became effective May 20, and will be enforced as soon as the mines resume operations.

Martins Ferry—Officials and members of the 12th district executive board of the United Mine Workers of America re-

cently began paying the first benefit since the strike was declared May 1. These benefits will amount to approximately \$90,000 per week.

Canal Dover—The Goshen Coal Co., of Cleveland, the largest operator in Tuscarawas County, retires from the field on account of the anti-screen law. Its properties will be leased to local parties.

INDIANA

Terre Haute—The average work in this field is now only about two days per week and several of the larger mines are idle. The Bunsen mine, one of the costliest plants in the state, is shut down indefinitely. It is believed that there is some strengthening of the demand for steam coal and that this will improve from now on. As yet there has been no material increase in the output of Indiana coal because of the strike in Ohio, but should this continue some weeks there must be a larger demand for the Indiana product.

ILLINOIS

Wasson—John Kay, County Mine Inspector of Saline County, recently made an investigation of Wasson mine, and found the drum on the hoisting engine in a dangerous condition. The miners refused to go to work until the defective drum has been replaced, and, as a consequence, the mine will be idle for about three weeks. John Kelley, Vice-President of the 7th Sub-District, was called on, but sustained the action of the men.

Murphysboro—The two Murphysboro mines of the Big Muddy Coal & Iron Co., with head offices in St. Louis, recently resumed operations, after having been closed since Mar. 31. These two mines employ about 500 men.

Chicago—The O'Gara Coal Co., in nolo contendere proceedings recently accepted a fine of \$5000 in two cases which remained of the Federal suit based on the shipment of coal from the Illinois field in Saline County to the East under preferred rates.

East St. Louis—With the settlement of the controversy between the coal miners and operators of Illinois a number of mines have reopened and coal is commencing to move once more. This settlement is of great importance to the Chicago & Alton and other coal-carrying railroads which depend upon the mines for a large proportion of their freight traffic. With the suspension of the mines the freight business dropped to the lowest degree reported in many years, with a corresponding decrease in forces of train, engine and yard men.

The Vandalia R.R. Co. was recently found guilty of granting a rebate of approximately \$36,400 to the Lumaghi Coal Co. in the United States district court of East St. Louis. Attorneys for the railroad filed a motion for a new trial. The specific offence was that the road borrowed \$260,000 and lent it to the coal company at 2 per cent. interest. The difference between this rate and the ordinary rate of interest was considered as a rebate by the Government attorney. In return for the loan the coal company is alleged to have promised to ship its coal over the Vandalia road, giving that company an income of about \$182,000 a year as freight revenue.

Urbana—The senior class in mining engineering at the University of Illinois has recently returned from a trip of inspection, including the cement quarries, underground mines and manufacturing plants near Oglesby, Ill. The longwall mines near LaSalle were also visited and the geology of the region studied. The party also visited the steel works in South Chicago and Gary, Ind., and various plants in Chicago, where mining machinery is made, and thoroughly inspected the accounting systems of some of the large coal companies, whose offices are in Chicago.

MISSOURI

Kansas City—The Fidelity Trust Co. of Kansas City, purchased the stocks and bonds of the Osage Coal & Mining Co., and the Great Western Coal & Coke Co., at a sale on May 19. This stock was held by the Fidelity company as collateral on loans aggregating \$866,300.

A meeting will be held in Kansas City early in June for the purpose of renewing the agreement between miners and operators in districts Nos. 14, 21 and 25, comprising the coal fields of Missouri, Kansas and Arkansas. The various districts and the Southwestern Interstate Coal Operators Association have already appointed scale committees.

IOWA

Mason City—The Iowa State Manufacturers Association in its annual convention at Mason City, appointed a committee to attend future meetings of operators and miners and there present the views of the association as laymen.

ARKANSAS

Ft. Smith—Charging wholesale violation of the mining laws, Mrs. J. B. Harry, of Hereford, recently filed suit against the Mammoth Vein Mining Co. and subsidiaries, as the result of the death of her husband, a shotfirer. The amount asked is \$32,626 being the largest ever claimed in Arkansas in a similar case.

OKLAHOMA

Oklahoma City—All the coal mines and wholesale dealers in the state are ordered to sell coal to farmers' unions, lodges and all other organizations at the same prices charged local dealers for like quantity and quality of fuel, in an order issued by the Oklahoma Corporation Commission. This mandate becomes effective in June. The commission holds that the Oklahoma Anti-Trust Law applies to the coal operators and dealers, requiring them to sell without discrimination to organizations, as well as to local dealers when money for payment is deposited in a bank.

NEW MEXICO

Santa Fe—If present plans are carried out, New Mexico will soon have a state-owned coal mine, producing fuel for use at the capital and executive mansions, at the penitentiary and the state school for the deaf and dumb. On a section of state-owned land was discovered a vein of coal, which, it is believed, can be easily worked by drifting. It is proposed at once to develop this deposit with convict labor. A tippie, buildings, etc., together with a camp, will be established and mining carried on systematically under the supervision of experts.

COLORADO

Denver—The members of the coal consumers legislative league are circulating petitions for the initiating of an amendment empowering the state to mine and sell coal in competition with private operators. This measure if adopted will reserve to the state all the rights beneath the surface of all state lands whether leased or sold. It makes some provision for the creation of workmen's insurance funds, and also authorizes the sale of \$500,000 in bonds as the initial capital for the equipment of the proposed state coal mines.

PERSONALS

J. W. Jeffrey, a son of J. E. Jeffrey, founder of the Jeffrey Mfg. Co. has been made vice-president of the concern.

H. V. Croll has been appointed sales manager for the American Concentrator Co., with main office at Springfield, Ohio. Mr. Croll has been located with the above company at its Philadelphia office for the past two years.

A. H. Wood, of Petros, Tenn., has decided to go into consulting engineering in the coal field. A long experience and study of the economic possibilities of the southern Appalachian coal field, from West Virginia to Alabama, should admirably fit him for this kind of work.

John M. Roan, formerly state safety superintendent, through a reorganization of the Mining Department of the Ohio Industrial Commission, becomes Chief of the Mining Department, and J. C. Davies, the former incumbent, becomes his first assistant. The new chief has had a varied experience in the coal business.

W. J. Richards, president of the Philadelphia & Reading Coal & Iron Co., on May 21, was elected president of the five subsidiaries of the Reading system, succeeding the late Geo. F. Baer. These subsidiaries are: The Delaware Coal Co., the Locust Gap Improvement Co., the Preston Coal & Improvement Co., the Tremont Coal Co. and the Fulton Coal Co. These properties are all operated by the Philadelphia & Reading Coal & Iron Co.

CONSTRUCTION NEWS

Cairnbrook, Penn.—It is understood that the Loyalhanna Coal & Coke Co. will shortly build a superintendent's house and a number of miners' houses. This work is to be begun as soon as possible.

Slemp, Ky.—The Leatherwood Coal Co. has been organized by A. C. Cornett and others with a capital stock of \$40,000, and will develop an area of about 2000 acres on Leatherwood Creek. A short branch from the Louisville & Nashville will be built into the property, and the development work is to start at once.

Toledo, Ohio.—Contractor George Mercer, of Bowling Green, Ohio, has started work on a new coal yard for Samuel Davis on the Terminal R.R. at Elm and Utica Sts. The yard will be 400x160 ft., and will be equipped with the latest machinery for handling coal. According to the contract, it is to be finished in 90 days, and will be the largest yard in Toledo.

Whitesburg, Ky.—The Slemo Consolidated Coal Co. has purchased a large boundary of coal land from the Letcher County Coal & Improvement Co. in Letcher County, and will open the property for early development. It will be necessary to build two short branches of the Louisville & Nashville R.R. in order to make these developments. Thousands of dollars will be expended in this work.

Kittanning, Penn.—It has just been announced that the giving of a mortgage for \$4,500,000 by the Shawmut interests is to enable the company to extend the Pittsburgh & Shawmut R.R. from Kittanning to Freeport in the Allegheny Valley. Work has already been begun. Several new mines will be opened as the railroad reaches convenient points in the district, and at Freeport connection will be made with the Pennsylvania R.R. The extension enables the Shawmut to ship on the river southward. The road extension will be finished this season, a distance of about 20 miles.

NEW INCORPORATIONS

Pittsburg, Kan.—The J. J. Stephenson & Sons Coal & Mining Co., of Pittsburg, has been organized with a capital stock of \$25,000.

Roosevelt, Ky.—The Wolf Coal Trading Co. has been incorporated with a capital of \$10,000. W. H. Soper, C. H. Whitlaw and T. C. Louks are the incorporators.

Beech Creek, Ky.—The Kirk Coal Co. has been incorporated in this county with a capital of \$10,000. The incorporators are L. Z. Kirkpatrick, H. L. Kirkpatrick and C. Kirkpatrick.

Owensboro, Ky.—The W. F. Overstreet Coal Co., recently filed articles of incorporation in the office of the County Clerk. The capital stock is fixed at \$2000, divided into 40 shares of \$50 each.

Fairmont, W. Va.—The Price Coal Co., the Manitoba Coal Co. and the Ferndale Coal Co., incorporated under the laws of West Virginia, have dissolved. C. E. Hutchison, of Fairmont, was president.

Terre Haute, Ind.—The Indiana-Hocking Coal Co. has been organized with a capital stock of \$5000, for the purpose of mining coal. The directors are Walter Bledsoe, Earle Shagley and A. T. Bennett.

Huntington, W. Va.—The Seakay Coal Co. has been organized to operate mines in Logan County. It has an authorized capital of \$50,000, and its incorporators are F. D. Clifford, E. M. Jackson, C. F. Boyers, C. M. Roehrig and O. B. Casco, all of Huntington.

Kansas City, Mo.—The Farmers' Fuel Co. has filed articles of incorporation, the capitalization being placed at \$62,500. The incorporators are H. C. Snider, V. K. Tuggle, J. H. Bovard and others. This firm will take over a mine at Higginsville, Mo., which has been operated by receivers for the defunct Farmers' Coal Co.

INDUSTRIAL NEWS

Birmingham, Ala.—The suit between Dosenbach & Son, of St. Louis, holders of \$67,500 of the bonds of the bankrupt De Soto Mining and Development Co., and R. A. Porter, trustee, was decided in favor of Dosenbach & Son by the referee in bankruptcy on May 21.

Dante, Va.—The Clinchfield Coal Corporation will shortly place in operation in its mines a number of new General Electric mining locomotives, comprising three 5-ton, seven 6-ton, and five 16-ton machines. All of these motors will be 48-in. gage, and built for a 250-volt circuit.

Albany, N. Y.—The up-State Public Service Commission recently refused to allow the New York Central Ry. to substitute coal for oil as fuel on the trains running through the Adirondack forest reserve. The use of oil was ordered originally because of the danger of sparks from coal causing forest fires.

Montgomery, Ala.—Consideration of citations to all Alabama railroads to show cause why the State Railroad Com-

mission should not order a general revision in rates on coal from the mining districts to all points in the state has been postponed until June 22. This order was issued at the request of complainants from several cities.

Pittsburgh, Penn.—The banquet of the Mine Inspector's Institute of the United States of America will be held at the Monongahela House, Pittsburgh, Wednesday evening, June 10, 1914, at 7 o'clock. After the dinner a number of prominent speakers will address the assembly on important mining topics. Good music will also be rendered.

Baltimore, Md.—Stockholders of the Elkhorn Fuel Co. were recently notified of their rights subject to allotment to subscribe to the unsold preferred and common shares of the Elkhorn Mining Corporation, which has leased from the first named company 20,000 acres of coal land in the Elkhorn field of Kentucky, which is now being developed.

Frackville, Penn.—The State Highway Department in its interpretation of the state law has ruled that the cave-in along the state road to Frackville will have to be repaired by the coal company which operates its plant near there, as it was the workings of this company Thorn & Neal by name that caused the cave-in along the road mentioned.

Cleveland, Ohio.—Railroads entering Cleveland are storing up thousands of tons of coal just outside the city limit. This is being done so that the roads will not be affected by any shortage of fuel if the operators keep the mines closed or the miners continue their strike. The Lake Shore R.R. alone is unloading from 20 to 30 carloads of coal each day.

Birmingham, Ala.—The Tennessee Coal, Iron & R.R. Co. has received an order for 5000 tons of steam coal for one of the United States war vessels for delivery through Pensacola. This coal will be shipped within a few days. It is probable that a standing order will be placed with this company for delivery through Pensacola, Mobile, New Orleans and Galveston.

Des Moines, Ia.—On May 19 the Christey Box Car Loader Co. shipped the largest box-car loader in its history. This machine was consigned to the Northwestern Fuel Co., at Superior, Wis., for use on the coal docks. Coal is transferred from lake freighters into hoppers or bins by clam-shell buckets, from whence it is fed by this box-car loader into box cars. The machine is capable of handling 3000 tons per day.

Washington, D. C.—According to the U. S. Geological Survey, all records for the production of coke in the United States were broken in 1913 when the total output was 46,311,369 short tons valued at \$128,951,430. Last year's production exceeded that of 1912 by 2,327,000 short tons. Of the total output in 1913, 33,596,669 short tons were made in beehive ovens, while 12,714,700 short tons were made in retort or byproduct ovens.

New Orleans, La.—Options have been renewed on yard property held here by Pittsburgh and Kentucky companies. This land is being held awaiting possible business expansion after the opening of the Panama Canal. It is announced that plans in regard to this venture have not taken form as yet. There is reason to think, however, that this will be made a point of distribution for cargoes for the west coast of both North and South America.

London, England.—The steam collier "Turret Hill" was recently sunk in the North Sea, owing to the shifting of her cargo. The chief engineer who was picked up by a passing steamer said that the vessel turned turtle, going over so rapidly that there was no chance to launch a boat. The captain was also rescued by another vessel, after he had clung for several hours to a lifebuoy. The remainder of the crew numbering 12 are believed to have been drowned.

Louisville, Ky.—The North Jellico Coal Co. will shortly install considerable new electric equipment at Woodbine and Pineville, Ky. The equipment in the station includes a 500-kw. Curtis turbo-generator with a 7-kw. exciter, two 200-kw. rotary converters, three 65-kv.a. transformers, and a switchboard. There will also be installed in the mine five 6-ton electric mining electromotives. The contract for all of the electrical equipment above mentioned has been placed with the General Electric Co.

Whitesburg, Ky.—Since the recent visit of a party of 60 capitalists, bankers, railroad men, and coal operators through the coalfields of Boone's Fork and Elkhorn Creek, in this county, new development work has been announced besides vast increases in the plant of the Consolidation Coal Co., the Elkhorn Mining Corporation, and the Mineral Fuel Co., in which much capital will be expended. It is said that new stock was taken by the financiers in the old operating companies, and that arrangements were practically perfected for the opening of other plants.

Coal Trade Reviews

General Review

Anthracite gradually slowing down. Bituminous demand less than output, but there are indications of a stronger undertone. Much surplus coal still in evidence. Lake trade proving a sharp disappointment.

The anthracite market is being maintained with some difficulty. Full-time operations continue the rule with the large companies, all of which rounded out the current month with plenty of orders for the prepared grades still on hand. Individuals, however, are offering concessions all along the line with the possible exception of stove coal which is in moderately short supply. The steam grades are particularly long, and are being stocked heavily. Dealers generally are seeking business aggressively. The market is firmest at down east New England points, and in the Western all-rail trade.

The bituminous demand has still failed to catch up with the supply, even under the heavily curtailed production. Large demurrage bills are accumulating at tidewater, and producers who have persisted in shipping down on consignment received a severe setback during the week; some important tonnages have been negotiated at less than enough to cover freight charges alone. But even in the face of the many adverse conditions, there are well informed and conservative observers who see indications of a stronger undertone, and are of the opinion that the trade is gradually shaking out the uncertainties of the past two months and getting down to a normal basis.

Moderate concessions on both contracts and spot business, together with a small consumption and a light demand in all directions, particularly in the lake trade, are the predominating features of the Pittsburgh market. Junction and terminal points seem to be less congested, and operators are apparently restricting shipments of consignment coal, but it is generally agreed by all that the consumer is in firm control of the situation.

The two months' complete shutdown in Ohio is beginning to develop a strained situation as regards both the employer and employee, particularly the latter, and vigorous actions toward a settlement are now under way. As regards the market situation, the effects have been nil. Stocks generally are lasting longer than was anticipated, while brokers are filling their contract obligations with higher grade West Virginia fuel, but at lower figures than the Ohio product. As a result of the excessive stocks at the upper lake ports, together with an almost complete absence of the vessels, the lake business is proving a sharp disappointment to the trade. River points have all been heavily stocked during the recent high-water stage. Concessions on the regular circular, involving small tonnages, are reported in Hampton Roads where the movement continues at about the average, though confined mostly to contracts.

The Southern markets are reported rather strong, May shipments showing a decided increase. Some slight improvement is also noted in the Middle Western fields, due to larger requisitions on railroad contracts, and an increased steam demand.

summer coal. Pennsylvanias, which are largely dependent on the condition of the Southern coal market, are naturally light in demand.

Marine Freights remain low, due to the record dispatch prevailing at all loading ports and to the light tidewater business. The usual rate, Hampton Roads to Boston, is 60c. but large bottoms can be had at 55 cents.

Anthracite—The companies are soliciting orders for everything but stove size. The May circular continues to be maintained in this section.

Bituminous prices at wholesale are about as follows:

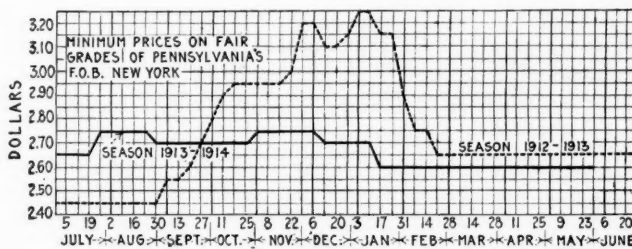
	Clearfields	Cambrias Sommersets	Georges Creek	Pocahontas New River
Mines*	\$0.30@1.50	\$1.20@1.65	\$1.67@1.77	
Philadelphia*	2.15@2.75	2.45@2.90	2.92@3.02	
New York*	2.45@3.05	2.77@3.20	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.80@2.85
Boston†				3.40@3.70
Providence†				3.50@3.78

* F.o.b. † On cars.

NEW YORK

Bituminous shippers of consignment coal receive a severe setback, but a more hopeful feeling prevails. Concessions obtainable on all anthracite grades except stove coal. But large companies report plentiful orders.

Bituminous—Soft-coal operators who persisted in shipping coal to tidewater without specific orders, were taught a severe lesson during the past week. Stocks are very heavy in all directions, one company reporting some 200 tons on demurrage at Port Reading. Many of the large consumers are said to have all the way from one to three or four months' supplies on hand, although the fact that there was rather more inquiry than usual during the week indicates that others are beginning to run short. The generally depressed condition of the market has been further accentuated by an unusually poor demand for steamship fuel for the time being; this business is generally erratic, but has been consistently hanging around the low point for the past two weeks or more.



On the bull side of the market there are well informed and conservative observers who believe they see indications of better conditions. There seems to be no tangible evidence of such, aside from the fact as already mentioned, that there have been a few more inquiries; but it is nevertheless a fact that some members of the trade are assuming a more hopeful attitude over the future.

About 750 tons of Cambria County, Penn., coal was offered during the week at \$1.70 alongside, or 5c. less than the freight, while sales have been negotiated on the basis of 60 to 65 cents f.o.b. mine on distress coal, with the sellers believing that they had obtained a good bargain. However, the nominal market continues on the same basis as before, as follows: West Virginia steam, \$2.50@2.60; fair grades Pennsylvania, \$2.60@2.70; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.10@3.15; Georges Creek, \$3.15@3.25.

Anthracite—The large hard-coalers report that they are still behind on the prepared grades and that a great many orders will be carried over into next month. The steam grades are generally reported easy, with many of the companies putting them back into storage.

But with the individuals, conditions are radically different. No premiums whatever are to be had, and stove coal is the only grade selling at the full circular. Of the other

EASTERN MARKET

BOSTON

Delivered price for Pocahontas and New River very weak. Pennsylvania demand practically nothing. Anthracite remains quiet with shippers soliciting orders. Marine freights continue low.

Bituminous—At Hampton Roads there is a large accumulation of New River and Pocahontas. The \$2.85 f.o.b. price has not been openly shaded on f.o.b. sales but there can be no doubt that the return on cars at Mystic Wharf do not net back anything like that figure. The consumers all over New England have not only ample stocks but in many cases more water power than they can use with the result that even contract demand is extremely light. In some cases the fear of a light fall business is another deterrent to the taking on of

prepared grades, egg is selling at 15c. off the circular, with chestnut heavy at 20c. off, and pea in long supply at 25 to 30c. less than circular quotations.

In the steam department, low-grade buckwheat can scarcely be moved at any figure, while off-quality rice, which was in good demand a few weeks ago, is also beginning to feel the effects of the heavy pressure. The individuals are beginning to curtail shipments of barley to tidewater, but the off grades are still selling at low figures; the high grades continue active at the full circular, though occasional odd lots on demurrage are selling at a concession of 30c. The better qualities of buckwheat are hardly moving at 10 to 15c. off the circular, and individuals are holding tonnages on boats awaiting a better price.

We quote the New York hard-coal market on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$4.70	\$4.55@4.70	\$4.65	\$4.50@4.65
Egg.....	4.95	4.85@4.95	4.90	4.75@4.90
Stove.....	4.95	4.95@4.95	4.90	4.90@4.90
Chestnut.....	5.20	5.00@5.20	5.15	4.95@5.15
Pea.....	3.55	3.40@3.55	3.45@3.50	3.20@3.45
Buckwheat.....	2.80	2.65@2.80	2.50@2.75	2.10@2.75
Rice.....	2.30	2.25@2.30	2.00@2.25	1.70@2.25
Barley.....	1.80	1.55@1.80	1.70@1.75	1.20@1.70

PHILADELPHIA

Prospects not good for anthracite trade in June. Curtailed mining anticipated. Retail trade very inactive. Bituminous situation still disappointing, with little or no improvement in the outlook.

Anthracite—The month of June is not likely to hold much in the way of extensive trade, for the anthracite business. Outside of New England, where the market is still normal, all other sections of the country seem to be on the verge of a slump. Curtailed mining is freely predicted. The local retail market is far from being satisfactory. Solicitations by the dealers meet with the response that the taking on of coal into cellars will be postponed until the fall. In fact, it is doubtful if retailers ever went after business as diligently as has been the case this year, but their efforts have been generally abortive.

As previously indicated, this is undoubtedly due to the industrial inactivity. The lack of cash to buy does not appeal to the average dealer, and he prefers to wait for the business later, rather than run the chance of losing not only the fuel, but the investment also. The bright spot in the situation is the New England market. The large fleets of barges trading to this territory, still continue to be well taken care of, filling orders, which embrace all sizes from broken to chestnut, with the heaviest demand on stove. Eliminating this feature, the market is dull and while there is no cessation of operations as yet, it seems likely to come in the near future. The usual advance of 10c. per ton will become effective on the first of June, making tidewater prices on that date as follows:

	Circular	Individual
Broken.....	\$4.45	\$4.45
Egg.....	4.70	4.60
Stove.....	4.70	4.70 @ 4.80
Chestnut.....	4.85	4.95
Pea.....	3.25	

Bituminous—The bituminous situation holds out even less hope than anthracite. It is going from bad to worse. Even with curtailed mining in many districts, the demand does not catch up with the supply, and prices have a tendency to sag. Contracts are being suspended, and large demurrage bills are accumulating at tidewater, with coal selling at ruinous prices, in some cases netting little more than the freight.

BALTIMORE

Foreign movement holds well and anthracite men believe that the next month will see a fair business. Bituminous as whole has experienced the worst week of the summer.

The past week has been the worst of the present flat spell, little or no new business developing. In the mining regions of western Maryland, West Virginia and western Pennsylvania the same tale is told of more coal on hand than can be disposed of, even with a curtailed production. Hope of a demand from the Lakes is bolstering up the West Virginia trade, for there is little business east on other than existing contracts. Slack is a sort of shuttle-cock of the trade, and sells variously, at from 50 to 65c. Three-quarter gas ranged between 80 and 90c. and steam coals at from 85 to 95c. Little change was noted in the Pennsylvania situation where producers are holding better coals for improved market conditions. Medium and low-grade fuels sell variously at from 95c. to \$1.15.

That Baltimore is coming in for more of the foreign business is indicated in the large number of vessel charters being

announced for June loading. Most of these will coal at the Curtis Bay pier of the Baltimore & Ohio R.R. The action of Congress in authorizing the deepening of the water approaches in Curtis Bay will mean another large pier there in the near future, the Baltimore & Ohio having announced their intention of erecting one in such an event.

While the May anthracite trade was less than in some former years, with a number of dealers, the hard-coal men are expecting a healthy June demand.

CENTRAL STATES

PITTSBURGH

Consumption small and demand light in all directions, particularly in the Lake trade. Substantial concessions made on new contracts. Coke eased off still further and now at the lowest point for some time.

Bituminous—There has been no increase in coal production in the past week, following the increase reported a week ago, when our estimate was that the Pittsburgh district was operating at 50 to 60% of capacity. A closer estimate would probably be 50 to 55%. The chief cause of the low rate is the small demand for the lake trade and the light demand in near-by territory, by railroads and manufacturing interests. The existence of stocks in consumers' hands is an influence, but now a relatively small one, as the stocks are fairly well liquidated. The actual consumption of coal is small.

The stocks accumulated by consumers months ago, in anticipation of a mining suspension, have been having this important effect, that they have very largely enabled consumers to postpone the making of annual contracts. Without stocks, there would have been wholesale renewal of contracts which expired Apr. 1; as it is, the bulk of the contracts are still unclosed, although two months of the new twelve-month have passed.

In such contracting as has occurred, regular prices have usually been cut, in the case of contracts at all desirable, and there are rumors that in extreme instances the cutting has been as much as about 20c. a ton for mine-run. For prompt shipment there has likewise been cutting. It is impossible to quote a definite market, but in general it can be stated that the bulk of the coal is realizing 10@20c. under the nominal price, except on slack, in which the concessions average nearer to 5@10c. The nominal prices remain: Slack, 90c.; nut and slack, \$1.05; nut, \$1.25; mine-run, \$1.30; ¾-in., \$1.40; 1¼-in., \$1.50, per ton at mine, Pittsburgh district.

Connellsville Coke—The market has grown very soft. One or two aggressive sellers have gone forth to book contracts for furnace coke for delivery after June 1, and to close such business they have had to shade the \$2 price by at least 15c., and possibly by 25c. in some instances. The operators who were openly committed to the \$2 figure have not openly receded, but they are making no effort to sell and may revise their figure later when furnaces are forced to close. The leading foundry-coke producers have reduced their nominal asking price from \$2.75 to \$2.65, as some foundry coke of fairly good grade has been going for weeks at \$2.50 and less. The market is quotable as follows: Prompt furnace, \$1.80@1.90; contract furnace, \$1.85@2; prompt and contract foundry, \$2.35@2.65, per ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended May 16 at 294,715 tons, a decrease of 17,385 tons, and shipments at 275,830 tons, a decrease of 15,336 tons. Production appears to have exceeded shipments by 18,885 tons, making a total excess in the past eight weeks of no less than 84,860 tons, according to the "Courier" figures.

BUFFALO

Some cleaning up of bituminous on track, but not sufficient to improve the demand. Mines mostly running at a slow rate. Railroads not making contracts. Coke still inactive and anthracite quiet.

Bituminous—There is little stir in the trade, though it looks as if the operators and jobbers were more cautious about shipping unsold coal. Some of the terminal and junction points are less badly congested, but there is still excess coal everywhere. Some of the smaller mine owners and sales agents are hopeless; they say that it is impossible to do business at a profit and they are making little effort to go on. As a rule all the mines in the Allegheny Valley are running on part time, mostly because they have some contracts to take care of and they do not want to go out of business entirely. Buffalo is about as steady a consumer of bituminous as any point in this territory and it must be taken care of.

Some of the operators, not so well posted as they might be, are insisting on sales and shipping their output forward whether it is disposed of or not. With the market off so long, when there has been reason for expecting something better, it is hard to realize that the consumer is again in control of prices and is going to remain so for an indefinite time. The failure of bituminous coal to move by lake has intensified the dullness.

There is no real change in the condition of the bituminous market. Some mines are getting low prices, especially where the coal is not of the best or the sales organization is incomplete. Others claim that they are getting full prices, which are \$2.80 for Pittsburgh lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.15 for slack, with Allegheny Valley sizes about 25c. lower than Pittsburgh.

Coke—The market for all grades of coke is still as dull as ever, some dealers hardly being willing to discuss it. Prices rule on the basis of \$4.50 for best 72-hr. Connellsville foundry, as formerly.

Anthracite—There is a fair demand, the lake trade keeping up better than was indicated early in the month, the week's shipment being 121,000 tons. A few cargoes that were loaded last winter are still here, because the vessel is unable to find a fair amount of business. All branches of the lake trade are very dull.

There is some life to the Western all-rail trade and some shipping agents are short of supply, on account of a better tide-water trade. Locally the demand is very slack. Independent anthracite is not coming this way at all liberally and all jobbers are short.

TOLEDO

Lake trade dull as a result of the large stocks in the Northwest and the lack of return cargoes. Unfavorable decision on the screen law creates additional uncertainties among the operating interests.

There is still an absence of demand from both steam and domestic consumers and lake shipments are light. A few boats are loading for up-lake ports but the great quantity of coal left at the docks last winter and the lack of return cargoes makes the probability of much more fuel going up at this time, questionable.

The decision of the District court, upholding the constitutionality of the Green anti-screen law, has caused a great set back and operators in this section are very doubtful of the consequences. A stay of execution for fifteen days was, however, granted so that the case can be appealed to the appellate court. The case will be carried up and until a decision is rendered business will probably remain at practically a standstill. There are operators in this section who claim that if the decision stands it will put their companies entirely out of business.

COLUMBUS

Miners' officials declare a strike, dating from May 2 and benefits will be paid. Governor Cox issues a call for a conference of operators and miners. Ohio mine-run law declared constitutional.

All Ohio miners are still idle and will continue so for some time. Arrangements have been concluded for a conference of operators and miners to be held June 2 when an effort will be made to fix a new wage scale. This was brought about by the intervention of Governor Cox who invited the operators to his office for an informal discussion of the situation.

In the meantime the miners' officials, in order to relieve the distress among idle miners, called a strike in Ohio, dating from May 2 and strike benefits at the rate of \$3 weekly will be paid. For the time being only two weeks will be advanced as the treasury is much depleted. Enginemen and caretakers were not called out.

There is some increase in the demand for steam grades but the shipments from West Virginia and Kentucky are taking care of this. Because of the general business depression manufacturing plants have not been using so much fuel and the surplus stocks are lasting longer than was originally believed possible.

There is a slight increase in the demand for domestic grades but dealers have been able to take care of this from their surplus stocks. Some of the larger householders have shown a disposition to stock up earlier than usual and there is every indication of higher levels as the present situation will result in a depletion of stocks in every quarter.

What quotations are being made in the Ohio fields are as follows:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump....	\$1.45@1.35		\$1.50@1.40	\$1.40@1.35
2-inch.....	1.30@ 1.25	\$1.20@1.15	1.35@ 1.30	1.30@ 1.25
Nut.....	1.25@ 1.20		1.30@ 1.25	1.25@ 1.20
Mine-run.....	1.15@ 1.10	1.10@ 1.05	1.15@ 1.10	1.15@ 1.10
Nut, pea and slack.	0.85@ 0.80		0.85@ 0.80	0.75@ 0.70
Coarse slack.....	0.75@ 0.70	0.85@ 0.80	0.75@ 0.70	0.65@ 0.60

CLEVELAND

Although reserve stocks are rapidly disappearing the market fails to improve. Many plants are closed down temporarily. Lake trade is slowing up and freights have advanced on some smaller cargoes.

The wholesale market is again at a lower level, due largely to the lack of an outlet for Pennsylvania and West Virginia coals, which are being offered at low prices. A large number of manufacturies have used up their storage coal, but are buying little because they are working either part time or not at all. Brokers and operators who have contracts to supply No. 8 Ohio coal are filling orders with Fairmount gas and making more than they could were they selling No. 8. Fairmount slack can be bought to sell at \$1.70, but brokers have been forced to meet Yourgiogheny slack offerings at \$1.65 on track here. There is little demand for run-of-mine and three-quarter sizes. The general dullness of business in this vicinity is the real cause of the poor coal market.

Pocahontas operators are still hard pressed to sell slack. High-grade slack has been offered at \$1 and what would ordinarily be a good grade of coal and readily acceptable is selling at even less. The buyers are extremely particular with the result rejections are more frequent than they have been in the last year.

Lake Trade—The lake shippers have taken so much coal at some of the upper docks they are forced to shut down on shipments. Splint, Yourgiogheny and Pocahontas have gone up the lakes in large quantities and the docks did not have much space in the first place. The Pittsburgh Coal Co. has announced that it will contract for its vessel requirements in the next week or ten days.

Large ships are having difficulty finding cargoes. Vessels carrying 7000 to 10,000 tons are freely offered and coal shippers cannot possibly care for them until the dock space is cleared. On cargoes of less than 7000 tons, car service is being paid because boats cannot be readily obtained; 40c. a ton, 10c. above the rate, was offered to get a boat to load coal paying car service. Offers of 37½c. were freely made on small cargoes. These smaller boats cannot break even hauling coal to Lake Michigan light as some of the larger boats are able to do.

From the way the season is opening there is every reason to believe there will be a rush of business this fall. Coal will be needed toward the latter part of the season and a slow start in the lake trade always results in a rush before the close. Coal shippers will have to pay some extra freight to get their coal before the end of 1914.

The market for spot and shipment coal is nearly the same, quotations being as follows:

	Pocahontas	Yourgiogheny	Fairmount
Lump.....	\$3.05		
Lump, 14-in.....		\$2.35	
Lump, 4-in.....		2.25	\$2.00@2.05
Mine run.....	2.60	2.10	1.95
Egg.....	3.05		
Nut.....		2.10@2.15	
Slack.....	2.20@2.35	1.65@1.70	1.65@ 1.70

CINCINNATI

No perceptible improvement, although the domestic movement is steady. Light demand for steam grades is still a feature, while inability to get boats at the lake ports is holding up the movement in that direction.

A few optimistic members of the trade believe they detect a change for the better but this seems to be without any real foundation. The slow lake movement, which usually absorbs a large tonnage at this season, is a depressing factor of large importance.

Operators report that while there is little or no difficulty in getting all the cars needed at the mines, it is impossible in most cases to move coal further than the lake docks, as there are no boats available. Many steamers which have taken one cargo of coal out have tied up on the return trip, refusing to load coal again on account of the inability to obtain return cargoes.

River coal is plentiful, the favorable stage of the Ohio having given Pittsburgh operators ample opportunity to move large tows down. In fact, this and other points on the Ohio are now so well stocked that shipments are likely to be substantially reduced, even with the usual prospect of low water in the near future. A dull market in nearly every department continues.

DETROIT

Steam market practically dead and the effects of the general suspension are becoming more evident. Anthracite normal.

Bituminous—The effects of the slump in general business and the depression in all parts of the country are becoming more and more evident in the coal business. The fact that

the Ohio mines have now been idle for two full months together with partial curtailment in the other mining districts without in the least creating any shortage in the market is significant of the trend of conditions. The steam market is practically dead, with slack down to 35c., while domestic trade is, if anything, even worse. Pocahontas, egg and lump appear to be only grades in any demand at all.

Anthracite—The customary activity has prevailed in hard coal and if anything a little larger tonnage than usual has been moved. The demand still centers on stove coal and the line trade has improved with indications for still more business, as the summer advances.

HAMPTON ROADS

Shipments during week fair. Demand light on all grades. Some coal being dumped for government use.

The movement from Hampton Roads has been fairly good. There have been some days during the week when little work was done at any of the piers but at other times they were all working to full capacity so that on an average the dumpings show up fair.

The demand for spot New River and Pocahontas run-of-mine has been somewhat light with few large parcels reported sold. A greater part of the shipments moving have been on contracts. It is impossible to say at what price spot sales have been made but it is understood that some of the smaller suppliers have made some slight cut in order to move accumulated tonnage. There is practically no inquiry at all for high volatile coals and although some small cargoes have moved this has also been on contract going to the New England market.

Foreign cargoes have been shipped to Naples, Genoa, Montevideo, Trieste, La Plata, Port Spain and Havana. In addition to foreign and coastwise shipments, the government has loaded some more coal into colliers for use in Mexican waters and it is expected that during the next few days two foreign steamers will take government cargoes for the naval stations on the Pacific Coast.

LOUISVILLE

Increased demand for domestic coal. Settlement of the differences between the operators and the miners in the western Kentucky field has little effect on the situation.

The demand for steam sizes is practically nonexistent, according to operators and dealers with connections in both divisions of the Kentucky field. The railroads, which have been laying in coal for the sole purpose of relieving the congestion at the mines, are overstocked at all their coaling stations. Occasionally the renewal of a contract at a slightly reduced rate is noted though for the most part the operators are holding out for their regular prices.

Mines in the eastern Kentucky field are working on an average of three days a week, while there are no definite figures available as regards western Kentucky operations. Prices continue without change, though the operators are said to be looking forward to an improvement in the demand which will enable them to put an advance into effect.

SOUTHERN AND MIDDLE-WESTERN

BIRMINGHAM

Better feeling in the coal market than for several months. Lump coal more active and demand for steam grades better. Pig iron seems to be improving, but coke is quiet.

The market on lump coal is gradually improving. It is the usual custom for the retail yards to place their orders for summer and fall delivery when the spring prices go into effect, but the majority of them failed to do so, believing that they would be able to buy at their own prices later on during the summer. However, recent developments indicate that business is going to be good and that there will be no reduction in the regular prices, so the retailers are beginning to come into the market. May deliveries will show a substantial increase over April.

While the steam business is not all that it could be, still, the general opinion is that within the next 30 days the situation will be normal, and the mines will be running to their usual capacity. Manufacturers of pig iron are more optimistic regarding the future.

NEW ORLEANS

Sales are below normal despite extra business resulting from the presence of the fleet in Gulf waters. Interior demand is very light. New yards along canal makes city delivery cheaper.

Coal sales are much below normal. Some sales are being made to cotton gins and other plants but retail dealers in the towns and cities are not stocking up as yet. Owing to the scant offerings of ocean freight the number of commercial vessels making this port is smaller than usual and as a result less coal is being taken on the water front. The presence of a number of refugee vessels and government transports has resulted in some business but practically no coal is being shipped to Mexico. Business with other Latin American countries, at no time large, is normal.

Negotiations are in progress for yard room along the New Basin Canal which will allow the landing of coal in the heart of the city from barges, and should effect some reduction in the cost of handling.

Prices are being demoralized by the concessions that all companies are making to get business. Local dealers were disappointed in not getting the navy yard business. Government colliers now are replenishing the stock there with coal from Norfolk.

CHICAGO

Chicago coal market continues dull. The closing of a few railroad contracts and a slight gain in the demand for steam coal the only relieving factors. Anthracite trade suffering from money shortage. Unusually dull conditions prevail in smokeless coal and furnace and foundry coke.

The dull situation has been partially relieved by the completion of a few contracts by railroads and a slight increase in the call for steam coal. A small buying movement in screenings just keeps the price firm at what it has been for several weeks.

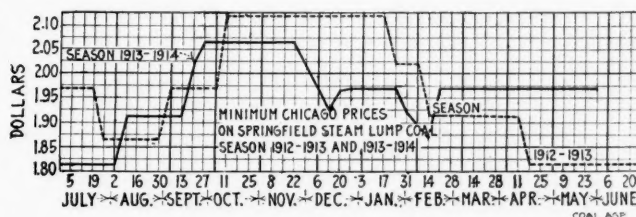
A shortage of money has caused a lack of interest in anthracite coal and resulted in weakening of the steam coal prices. It is usually customary for the anthracite consumers to purchase their coal in April or May to obtain the discount figures, but as a result of the present financial stringency, they are holding off.

A large number of dealers, who realize the position of smokeless coal among discriminating buyers, have been coming into the smokeless market with lower grades which analyze from 28 to 30 per cent. volatile matter. These coals are selling at from ninety cents to a dollar a ton on the track but this has had no material effect upon the real high grade smokeless, of which there have been few sales recently. Because of the continued dullness in the iron and steel trade, the same inactivity prevails in foundry and furnace coke. There is a little improvement in the demand for byproduct coke for domestic use.

Prevailing prices at Chicago are:

	Springfield	Franklin Co.	Clinton	W.Va.]
Domestic lump.....	\$2.07	\$2.30@2.40	\$2.12	
Steam lump.....	1.97		1.97	
Egg.....		2.30@2.40		\$3.65
Mine-run.....	1.87	2.15@2.25	1.87	3.05@3.30
Screenings.....	1.77	1.95	1.67	

Coke—Connellsville and Wise County, \$5@5.25; by-product egg, stove and nut, \$4.45; gas house, \$4.25.



ST. LOUIS

Coöperative and railroad-owned mines cutting prices and creating a weak market. Some further price reductions have been recorded.

During last season somebody was making money on different kinds of coal, but right now it seems to be a losing proposition on everything. In the Standard field the coöperative mines are the cause of all the trouble in one way, while the mines owned by the coal carrying railroads are the cause in another way. Both are a detriment to the independent operator, and keep the market continually below the cost of production.

The Government contract for the federal buildings, went to the Polar Wave this week, at \$2.12 delivered wagon-load lots, guaranteed to develop an exceptionally high B.t.u. value, on Standard lump coal. Figuring 92c. for hauling and freight, this leaves \$1.20. Franklin County coal is selling as low as \$1 and \$1.05 for the screened sizes, while Carterville is going at from \$1.10 to \$1.25. Both the Carterville and the Standard screenings market have fallen off some, the former selling at 75 and 85c. and the latter at 65 to 70c.

Independent and off-grade anthracite, is being offered as low as 38c. off the May circular. One of the relieving features to the anthracite trade has been the cancellation of the through rates in connection with the St. L. T. & E., which is owned by coal mining interests and also by St. Louis retailers. This company had about 28c. allowance from the Clover Leaf and connections, and had unlimited time at East St. Louis on their coal. They were thus able to cut the price whenever they felt so disposed, and nobody else could meet the competition. The St. Louis Coal Traffic Bureau accomplished something in this way.

Coke and smokeless are moving slow, and the retail trade is extremely dull.

KANSAS CITY

Wheat prospects helping the coal situation. Brisk bookings for June and July delivery reported. Mines showing tendency to extend operations.

Prospects for one of the largest wheatecrops in years have had a favorable effect on the coal situation. Wheat cutting will begin early in June and threshing will follow a fortnight later. Sales offices are devoting their efforts largely to selling farmers for June and July delivery, and the situation is much improved as a result. The tendency in some quarters to cut under the circular has about disappeared with the brisker demand, and the mines are extending operations. The worst of the summer lethargy is believed to be over, as demand from other sources will prevent extreme quietude in the late summer.

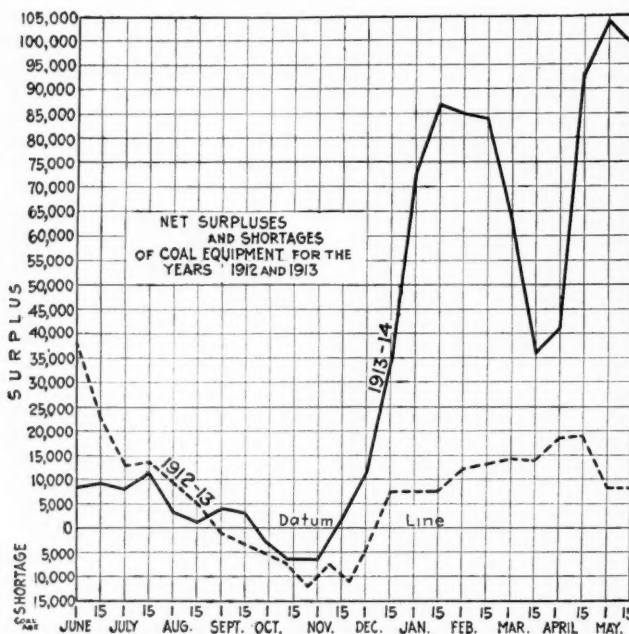
PRODUCTION AND TRANSPORTATION STATISTICS

THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended May 1, as follows:

	Surplus	Shortage	Net*
New England Lines.....	1,409	0	1,409
N. Y.; New Jersey, Del.; Maryland; Eastern Penn..	17,669	0	17,669
Ohio; Indiana; Michigan; Western Pennsylvania...	50,029	250	49,779
West Virginia, Virginia, North & South Carolina...	4,893	26	4,867
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida...	10,136	0	10,136
Iowa, Illinois, Wis., Minn.; North & South Dakota...	8,580	20	8,560
Montana, Wyoming, Nebraska.....	999	0	999
Kansas, Colorado, Missouri, Arkansas, Oklahoma...	2,706	13	2,693
Texas, Louisiana, New Mexico.....	441	4	437
Oregon, Idaho, California, Arizona.....	2,802	0	2,802
Canadian Lines.....	0	0	0
Total.....	99,664	313	99,351
Jan. 15	87,149	85,489	84,775
Feb. 15	84,775	64,822	39,133
Mar. 15	41,055	41,055	100,370
Apr. 1	789	102	239
Apr. 15	86,360	85,387	84,536
May 1	63,428	35,851	40,440
May 15	40,440	40,440	100,370

*Bold face type indicates a surplus.



NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during February, March and April of the current year in short tons:

	February	March	April
Pocahontas Field.....	942,477	1,161,793	1,156,670
Tug River District.....	204,074	246,490	221,344
Thacker District.....	198,228	274,786	232,181
Kenova District.....	71,401	88,616	96,116
Clinch Valley District.....	152,769	153,704	156,502
Other N. & W., Territory.....	3,694	2,741	2,827

Total N. & W. Fields.....	1,572,643	1,928,130	1,865,640
Williamson & Pond Creek R.R.....	26,314	43,865	79,828
All other railroads.....	67,518	140,123	171,818

Grand total..... 1,666,475 2,112,118 2,117,286

Distribution of shipments for April was:

	Shipped	Tipple	Total
Pocahontas.....	1,066,583	16,336	1,082,919
Tug River.....	219,221	2,123	221,344
Thacker.....	222,770	9,411	232,181
Kenova.....	87,884	8,232	96,116

Total..... 1,596,458 36,102 1,632,560

Shipments of coke, entirely from the Pocahontas field amounted to 64,340 tons.

The following is the destination of shipments for April and the first four months in short tons:

Coal	April		Four Months	
	1913	1914	1913	1914
Tidewater, foreign.....	147,917	188,413	535,211	617,185
Tidewater, coastwise.....	326,920	323,280	1,300,671	1,315,143
Domestic.....	1,068,383	1,605,493	5,401,914	5,929,365
Coke				
Tidewater, foreign.....	6,950		16,984	15
Domestic.....	122,845	2,204,204	7,816,249	8,265,295
Total.....	1,672,845	2,204,204	7,816,249	8,265,295

FOREIGN MARKETS

GREAT BRITAIN

May 15—The inquiry is limited, and, with supplies increasing, the tendency of values is easy. Quotations are approximately as follows:

Best Welsh steam.....	\$4.62	Best Monmouthshires.....	\$4.14
Best seconds.....	4.38	Seconds.....	3.96
Seconds.....	4.14	Best Cardiff smalls.....	2.58
Best dry coals.....	4.20	Seconds.....	2.46

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are net f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days.

Coke is quoted at: Special foundry, \$6.24; good foundry, \$4.80 @ 5.52; furnace, \$4.08 @ 4.56.

COAL SECURITIES

The following table gives the range of various active coal securities during the week ending May 23:

Stocks	Week's Range			Year's Range	
	High	Low	Last	High	Low
American Coal Products.....	84	84	84	86½	82
American Coal Products Pref.....	105	105	105	106	102
Colorado Fuel & Iron.....	28	27½	28	34½	24
Colorado Fuel & Iron Pref.....	140	140	140	140	140
Consolidation Coal of Maryland.....	102½	102½	102½	102½	102½
Island Creek Coal Com.....	49½	48½	48½	48½	48½
Island Creek Coal Pref.....	85½	85½	85½	85½	85½
Lehigh Valley Coal Sales.....	170	150	165	165	165
Pittsburgh Coal.....	89	88	88½	93½	84
Pittsburgh Coal Pref.....	18½	17	17½	23½	17½
Pond Creek.....	166½	165½	166½	172½	158½
Reading.....	89	89	89	89	87½
Reading 1st Pref.....	90	90	90	93	87½
Reading 2nd Pref.....	45	45	45	52	40
Virginia Iron, Coal & Coke.....	91	93½	91½	91½	95

Bonds	Closing		Week's Range or Last Sale	Year's Range	
	Bid	Asked		High	Low
Colo. F. & I. g n. s.f.g. 5s.....	90½	92	92	91½	99
Colo. F. & I. gen. 6s.....	105	107½	June '12	73	82
Col. Ind. 1st & coll. 5s. gu.....	73½	75	73½	73	79
Cons. Ind. Coal Me. 1st 5s.....	90½	92	90½	90½	90½
Cons. Coal 1st and ref. 5s.....	89	90½	90½	99½	99½
Gr. Riv. Coal & C. 1st s f g 6s.....	89	102½	Apr. '06	93	93½
K. & H. C. & C. 1st s f g 5s.....	89	87½	87½	84	84
Pocah. Con. Coll. 1st s f 5s.....	86½	87½	87½	87½	82
St. L. Rky. Mt. & Pac. 1st 5s.....	78	80	77	77	82
Tenn. Coal gen. 5s.....	103	103	103	103	103
Birm. Div. 1st consol. 6s.....	102	103	101½	101½	103
Tenn. Div. 1st g 6s.....	101½	102½	102	101	102½
Cab. C. M. Co. 1st g 6s.....	101	101½	101½	101½	101½
Utah Fuel 1st g 5s.....	84	73	73	73	73
Victor Fuel 1st s f 5s.....	91	93½	91½	91½	95
Va. I. Coal & Coke 1st g 5s.....	91	93½	91½	91½	95